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(54) Title: ISOXAZOLINE AND ISOXAZOLE DERIVATIVES AS INTEGRIN RECEPTOR ANTAGONISTS (57) Abstract This invention relates to novel heterocycle compounds including but not limited to 3-[3-(imidazolin-2-yl amino)propyloxy]isoxazol-5-ylcarbonylamino]-2-(benzyloxycarbonylamino)-propionic acid, which are useful as antagonists of the $\alpha_v\beta_3$ and related integrin receptors, to pharmaceutical compositions containing such compounds, processes for preparing such compounds, and to methods of using these compounds, alone or in combination with other therapeutic agents, for the inhibition of cell adhesion and the treatment of angiogenic disorders, inflammation, bone degradation, tumors, metastases, thrombosis, and other cell aggregation-related conditions.		

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TITLE

ISOXAZOLINE AND ISOXAZOLE DERIVATIVES AS INTEGRIN RECEPTOR ANTAGONISTS

FIELD OF THE INVENTION

10 This invention relates to novel heterocycles which
are useful as antagonists of the $\alpha_v\beta_3$ and related
integrin receptors, to pharmaceutical compositions
containing such compounds, processes for preparing such
compounds, and to methods of using these compounds,
15 alone or in combination with other therapeutic agents,
for the inhibition of cell adhesion and the treatment of
angiogenic disorders, inflammation, bone degradation,
tumors, metastases, thrombosis, and other cell
aggregation-related conditions.

20

BACKGROUND OF THE INVENTION

Angiogenesis or neovascularization is critical for
normal physiological processes such as embryonic
25 development and wound repair (Folkman and Shing, J.
Biol. Chem. 1992, 267:10931-10934; D'Amore and Thompson,
Ann. Rev. Physiol. 1987, 49:453-464). However,
angiogenesis occurs pathologically, for example, in
ocular neovascularization (leading to diabetic
30 retinopathy, neovascular glaucoma, retinal vein
occlusion and blindness), in rheumatoid arthritis and in
solid tumors (Folkman and Shing, J. Biol. Chem., 1992,
267:10931-10934; Blood and Zetter, Biochim. Biophys.
Acta., 1990, 1032:118-128).

35 Tumor dissemination, or metastasis, involves
several distinct and complementary components, including

the penetration and transversion of tumor cells through basement membranes and the establishment of self-sustaining tumor foci in diverse organ systems. To this end, the development and proliferation of new blood vessels, or angiogenesis, is critical to tumor survival. Without neovascularization, tumor cells lack the nourishment to divide and will not be able to leave the primary tumor site (Folkman and Shing, J. Biol. Chem., 1992, 267:10931-10934).

10 Inhibition of angiogenesis in animal models of cancer has been shown to result in tumor growth suppression and prevention of metastatic growth (Herblin et al., Exp. Opin. Ther. Patents. 1994, 1-14). Many angiogenic inhibitors have been directed toward blocking
15 initial cytokine-dependent induction of new vessel growth, e.g. antibodies to endothelial cell growth factors. However, these approaches are problematic because tumor and inflammatory cells can secrete multiple activators of angiogenesis (Brooks et al.,
20 Cell, 1994, 79:1157-1164). Therefore, a more general approach that would allow inhibition of angiogenesis due to a variety of stimuli would be of benefit.

 The integrin $\alpha_v\beta_3$ is preferentially expressed on angiogenic blood vessels in chick and man (Brooks et al., Science, 1994, 264:569-571; Enenstein and Kramer, J. Invest. Dermatol., 1994, 103:381-386). Integrin $\alpha_v\beta_3$ is the most promiscuous member of the integrin family, allowing endothelial cells to interact with a wide variety of extracellular matrix components (Hynes, Cell,
30 1992, 69:11-25). These adhesive interactions are considered to be critical for angiogenesis since vascular cells must ultimately be capable of invading virtually all tissues.

 While integrin $\alpha_v\beta_3$ promotes adhesive events
35 important for angiogenesis, this receptor also transmits signals from the extracellular environment to the

intracellular compartment (Leavesley et al., J. Cell Biol., 1993, 121:163-170, 1993). For example, the interaction between the $\alpha_v\beta_3$ integrin and extracellular matrix components promotes a calcium signal required for cell motility.

During endothelium injury, the basement membrane zones of blood vessels express several adhesive proteins, including but not limited to von Willebrand factor, fibronectin, and fibrin. Additionally, several members of the integrin family of adhesion receptors are expressed on the surface of endothelial, smooth muscle and on other circulating cells. Among these integrins is $\alpha_v\beta_3$, the endothelial cell, fibroblast, and smooth muscle cell receptor for adhesive proteins including von Willebrand factor, fibrinogen (fibrin), vitronectin, thrombospondin, and osteopontin. These integrins initiate a calcium-dependent signaling pathway that can lead to endothelial cell, smooth muscle cell migration and, therefore, may play a fundamental role in vascular cell biology.

Recently, an antibody to the $\alpha_v\beta_3$ integrin has been developed that inhibits the interaction of this integrin with agonists such as vitronectin (Brooks et al., Science, 1994, 264:569-571). Application of this antibody has been shown to disrupt ongoing angiogenesis on the chick chorioallantoic membrane (CAM), leading to rapid regression of histologically distinct human tumor transplanted onto the CAM (Brooks et al., Cell, 1994, 79:1157-1164). In this model, antagonists of the $\alpha_v\beta_3$ integrin induced apoptosis of the proliferating angiogenic vascular cells, leaving pre-existing quiescent blood vessels unaffected. Thus, $\alpha_v\beta_3$ integrin antagonists have been shown to inhibit angiogenesis. Based on this property, therapeutic utility of such agents is expected in human diseases such as cancer,

rheumatoid arthritis and ocular vasculopathies (Folkman and Shing, J. Biol. Chem., 1992, 267:10931-10934).

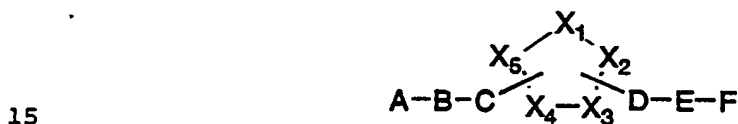
Increasing numbers of other cell surface receptors have been identified which bind to extracellular matrix ligands or other cell adhesion ligands thereby mediating cell-cell and cell-matrix adhesion processes. These receptors belong to a gene superfamily called integrins and are composed of heterodimeric transmembrane glycoproteins containing α - and β -subunits. Integrin subfamilies contain a common β -subunit combined with different α -subunits to form adhesion receptors with unique specificity. The genes for eight distinct β -subunits have been cloned and sequenced to date.

Two members of the β_1 subfamily, α_4/β_1 and α_5/β_1 have been implicated in various inflammatory processes. Antibodies to α_4 prevent adhesion of lymphocytes to synovial endothelial cells in vitro, a process which may be of importance in rheumatoid arthritis (VanDinther-Janssen et al., J. Immunol., 1991, 147:4207). Additional studies with monoclonal anti- α_4 antibodies provide evidence that α_4/β_1 may additionally have a role in allergy, asthma, and autoimmune disorders (Walsh et al., J. Immunol., 1991, 146:3419; Bochner et al., J. Exp. Med., 1991 173:1553; Yednock et al., Nature, 1992, 356:63). Anti- α_4 antibodies also block the migration of leukocytes to the site of inflammation (Issedutz et al., J. Immunol., 1991, 147:4178).

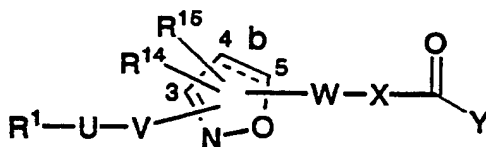
The α_v/β_3 heterodimer is a member of the β_3 integrin subfamily and has been described on platelets, endothelial cells, melanoma, smooth muscle cells, and osteoclasts (Horton and Davies, J. Bone Min. Res. 1989, 4:803-808; Davies et al., J. Cell. Biol. 1989, 109:1817-1826; Horton, Int. J. Exp. Pathol., 1990, 71:741-759). Like GPIIb/IIIa, the vitronectin receptor binds a variety of RGD-containing adhesive proteins such as vitronectin, fibronectin, VWF, fibrinogen, osteopontin,

bone sialo protein II and thrombospondin in a manner mediated by the RGD sequence. A key event in bone resorption is the adhesion of osteoclasts to the matrix of bone. Studies with monoclonal antibodies have implicated the α_v/β_3 receptor in this process and suggest that a selective α_v/β_3 antagonist would have utility in blocking bone resorption (Horton et al., J. Bone Miner. Res., 1993, 8:239-247; Helfrich et al., J. Bone Miner. Res., 1992, 7:335-343).

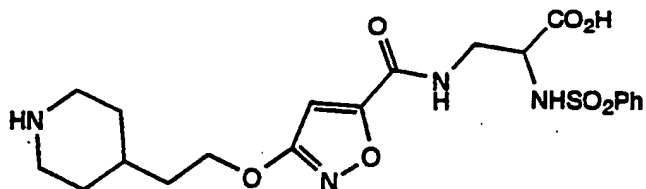
- 10 European Patent Application Publication Number 525629 (corresponds to Canadian Patent Application Publication Number 2,074,685) discloses compounds having the general formula:



- 20 Copending, commonly assigned U.S. Patent Application Serial Number 08/337,920 filed 11/10/94 discloses integrin inhibitors of the general formula shown below:



- 25 PCT Patent Application WO 94/08577 published 4/28/94 discloses fibrinogen antagonists, including the isoxazole-containing compound below:



None of the above references teaches or suggests the compounds of the present invention which are described in detail below.

SUMMARY OF THE INVENTION

The present invention provides novel nonpeptide compounds which bind to integrin receptors thereby altering cell-matrix and cell-cell adhesion processes. The compounds of the present invention are useful for the treatment of angiogenic disorders, inflammation, bone degradation, tumors, metastases, thrombosis, and other cell aggregation-related conditions in a mammal.

One aspect of this invention provides novel compounds of Formula I (described below) which are useful as antagonists of the α_v/β_3 or vitronectin receptor. The compounds of the present invention inhibit the binding of vitronectin to α_v/β_3 and inhibit cell adhesion. The present invention also includes pharmaceutical compositions containing such compounds of Formula I, and methods of using such compounds for the inhibition of angiogenesis, and/or for the treatment of angiogenic disorders.

The present invention also provides novel compounds, pharmaceutical compositions and methods which may be used in the treatment or prevention of diseases which involve cell adhesion processes, including, but not limited to, rheumatoid arthritis, asthma, allergies, adult respiratory distress syndrome, graft versus host disease, organ transplantation, septic shock, psoriasis,

eczema, contact dermatitis, osteoporosis, osteoarthritis, atherosclerosis, metastasis, wound healing, diabetic retinopathy, ocular vasculopathies, thrombosis, inflammatory bowel disease and other
5 autoimmune diseases.

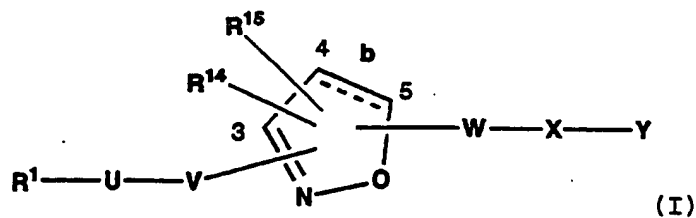
Also included in the present invention are pharmaceutical kits comprising one or more containers containing pharmaceutical dosage units comprising a compound of Formula I, for the treatment of cell
10 adhesion related disorders, including, but not limited to, angiogenic disorders.

DETAILED DESCRIPTION OF THE INVENTION

The present invention provides novel nonpeptide
15 compounds of Formula I (described below) which bind to integrin receptors thereby altering cell-matrix and cell-cell adhesion processes. The compounds of the present invention are useful for the treatment of angiogenic disorders, inflammation, bone degradation,
20 tumors, metastases, thrombosis, and other cell aggregation-related conditions in a mammal.

One aspect of this invention provides novel compounds of Formula I (described below) which are useful as antagonists of the α_v/β_3 or vitronectin
25 receptor. The compounds of the present invention inhibit the binding of vitronectin to α_v/β_3 and inhibit cell adhesion. The present invention also includes pharmaceutical compositions containing such compounds of Formula I, and methods of using such compounds for the
30 inhibition of angiogenesis, and/or for the treatment of angiogenic disorders.

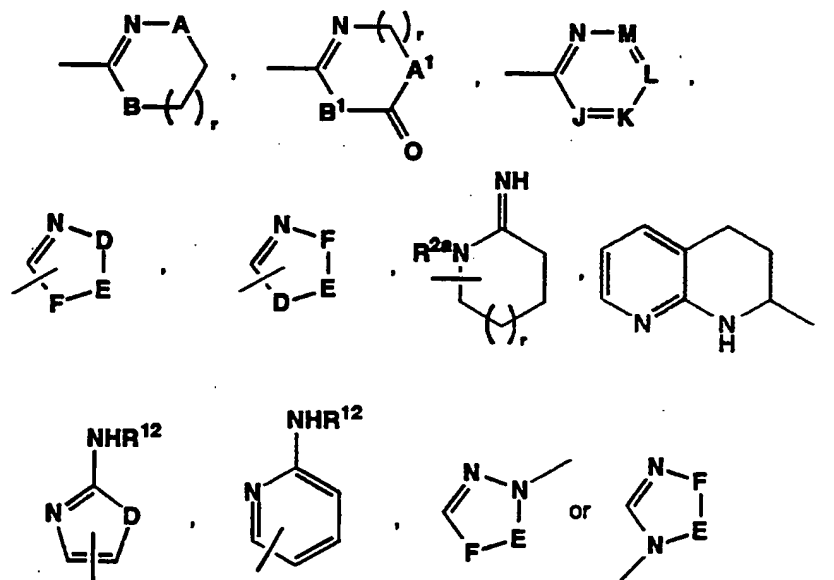
[1] The present invention comprises compounds of the Formula I:



including stereoisomeric forms thereof, or mixtures of
 stereoisomeric forms thereof, or pharmaceutically
 5 acceptable salt or prodrug forms thereof wherein:

b, the bond between carbon atoms numbered 4 and 5, is a
 carbon-carbon single or double bond;

10 R^1 is selected from:



A and B are independently $-CH_2-$, $-O-$, $-N(R^{12})-$, or
 15 $-C(=O)-$;

A^1 and B^1 are independently $-CH_2-$ or $-N(R^{10})-$;

D is $-N(R^{2a})-$, $-O-$, $-S-$, $-C(=O)-$ or $-SO_2-$;

E-F is $-C(R^2)=C(R^3)-$, $-N=C(R^2)-$, $-C(R^2)=N-$, $-N=N-$, or $-C(R^2)_2C(R^3)_2-$;

- 5 J, K, L and M are independently selected from $-C(R^2)-$ or $-N-$, provided that at least one of J, K, L and M is $-C(R^2)-$;

10 R^2 and R^3 are independently selected from: H, C_1-C_4 alkoxy, $NR^{11}R^{12}$, $=NR^{12}$, halogen, NO_2 , CN, CF_3 , C_1-C_6 alkyl, C_3-C_6 alkenyl, C_3-C_7 cycloalkyl, C_4-C_{11} cycloalkylalkyl, C_6-C_{10} aryl, C_7-C_{11} arylalkyl, C_2-C_7 alkylcarbonyl, C_6-C_{10} carbonyl or C_7-C_{11} arylcarbonyl;

15 alternatively, R^2 and R^3 , when substituents on adjacent atoms, can be taken together with the carbon atoms to which they are attached to form a 5-7 membered carbocyclic or 5-7 membered
20 heterocyclic aromatic or nonaromatic ring system, said carbocyclic or heterocyclic ring being optionally substituted with 0-2 R^7 ;

R^{2a} is absent or R^{12} ;

25

U is selected from:

- 30 $-(CH_2)_n-$,
 $-(CH_2)_nO(CH_2)_m-$,
 $-(CH_2)_nN(R^{12})(CH_2)_m-$,
 $-(CH_2)_nC(=O)(CH_2)_m-$,
 $-(CH_2)_nS(O)_p(CH_2)_m-$,
 $-(CH_2)_nNHNH(CH_2)_m-$,
 $-N(R^{10})C(=O)-$, or
 $-C(=O)N(R^{10})-$;
35 $-N(R^{10})S(O)_p-$, or

V is selected from:

- (CH₂)_n-,
- (C₁-C₆ alkylene)-Q-, substituted with 0-3 groups independently selected from R¹³,
- 5 - (C₂-C₇ alkenylene)-Q-, substituted with 0-3 groups independently selected from R¹³,
- (C₂-C₇ alkynylene)-Q-, substituted with 0-3 groups independently selected from R¹³,
- (phenyl)-Q-, said phenyl substituted with 0-2
- 10 groups independently selected from R¹³,
- (pyridyl)-Q-, said pyridyl substituted with 0-2 groups independently selected from R¹³, or
- (pyridazinyl)-Q-, said pyridazinyl substituted with 0-2 groups independently selected from R¹³;
- 15

Q is selected from:

- (CH₂)_n-,
- (CH₂)_nO(CH₂)_m-,
- 20 - (CH₂)_nN(R¹²)(CH₂)_m-,
- (CH₂)_nC(=O)(CH₂)_m-,
- (CH₂)_nS(O)_p(CH₂)_m-,
- (CH₂)_nNHNH(CH₂)_m-,
- N(R¹⁰)C(=O)-, or
- 25 - C(=O)N(R¹⁰)-;

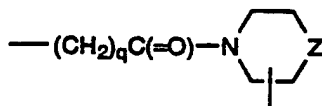
W is selected from:

- (C(R⁴)₂)_qC(=O)N(R¹⁰)-,
- C(=O)-N(R¹⁰)-(C(R⁴)₂)_q-;
- 30

X is selected from:

- a single bond (i.e., X is absent),
- (C(R⁴)₂)_q-[C(R⁴)(R⁸)]_s-C(R⁴)(R⁹)-;

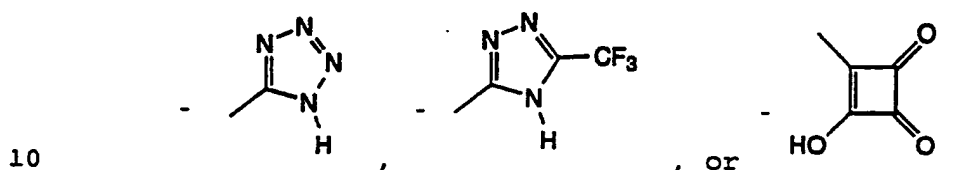
35 alternatively, W is



and X is absent or $-CH_2-$

Y is selected from:

- 5 $-COR^{20}$, $-SO_3H$, $-PO_3H$, $-CONHNHSO_2CF_3$, $-CONHSO_2R^{18a}$,
 $-CONHSO_2NHR^{18b}$, $-NHCOCF_3$, $-NHCONHSO_2R^{18a}$,
 $-NHSO_2R^{18a}$, $-OPO_3H_2$, $-OSO_3H$, $-PO_3H_2$, $-SO_3H$,
 $-SO_2NHCOR^{18a}$, $-SO_2NHCO_2R^{18a}$, or



Z is selected from $-CH(R^9)-$, or $-N(R^{16})-$;

- 15 R^4 is selected from H, C_1-C_{10} alkyl, C_1-C_{10}
 alkylcarbonyl, aryl, arylalkyl, cycloalkyl, or
 cycloalkylalkyl;

20 alternatively, two R^4 groups on adjacent carbon
 atoms may join to form a bond, thereby to form a
 carbon-carbon double or triple bond between the
 adjacent carbon atoms;

- 25 R^5 is selected from H, C_1-C_6 alkyl, C_2-C_6 alkenyl, C_2-
 C_6 alkynyl, C_3-C_7 cycloalkyl, C_7-C_{14} bicycloalkyl,
 hydroxy, C_1-C_6 alkoxy, C_1-C_6 alkylthio, C_1-C_6
 alkylsulfinyl, C_1-C_6 alkylsulfonyl, nitro, C_1-C_6
 alkylcarbonyl, C_6-C_{10} aryl, $-N(R^{11})R^{12}$, halo, CF_3 ,
 CN, C_1-C_6 alkoxycarbonyl, carboxy, piperidinyl,
 morpholinyl or pyridinyl;

30

R⁶ is selected from:

- H, C₁-C₁₀ alkyl, hydroxy, C₁-C₁₀ alkoxy, nitro, C₁-C₁₀ alkylcarbonyl, -N(R¹¹)R¹², cyano, halo, CF₃, CHO, CO₂R^{18b}, C(=O)R^{18b}, CONR¹⁷R^{18b},
 5 OC(=O)R¹⁰, OC(=O)OR²¹, OR¹⁰, OC(=O)NR¹⁰R¹¹, OCH₂CO₂R¹⁰, CO₂CH₂CO₂R¹⁰, NO₂, NR¹⁰C(=O)R¹⁰, NR¹⁰C(=O)OR²¹, NR¹⁰C(=O)NR¹⁰R¹¹, NR¹⁰SO₂NR¹⁰R¹¹, NR¹⁰SO₂R²¹, S(O)_pR¹¹, SO₂NR¹⁰R¹¹, SiMe₃, C₂ to C₆ alkenyl, C₃ to C₁₁ cycloalkyl, C₄ to C₁₁ cycloalkylmethyl,
 10 C₆ to C₁₀ aryl optionally substituted with 1-3 groups selected from halogen, C₁-C₆ alkoxy, C₁-C₆ alkyl, CF₃, S(O)_mMe, or -NMe₂;
 C₇ to C₁₁ arylalkyl, said aryl being optionally substituted with 1-3 groups selected from halogen, C₁-C₆ alkoxy, C₁-C₆ alkyl, CF₃, S(O)_pMe, or -NMe₂,
 15 methylenedioxy when R⁶ is a substituent on aryl, or a 5-10 membered heterocyclic ring containing 1-3 N, O, or S heteroatoms, wherein said heterocyclic ring may be saturated, partially saturated, or fully unsaturated, said heterocyclic ring being substituted with 0-2 R⁷;

25 R⁷ is selected from:

- H, C₁-C₁₀ alkyl, hydroxy, C₁-C₁₀ alkoxy, nitro, C₁-C₁₀ alkylcarbonyl, -N(R¹¹)R¹², cyano, halo, CF₃, CHO, CO₂R¹⁰, C(=O)R¹⁰, CONR¹⁰R¹¹,
 30 OC(=O)R¹⁰, OC(=O)OR²¹, OR¹⁰, OC(=O)NR¹⁰R¹¹, OCH₂CO₂R¹⁰, CO₂CH₂CO₂R¹⁰, NO₂, NR¹⁰C(=O)R¹⁰, NR¹⁰C(=O)OR²¹, NR¹⁰C(=O)NR¹⁰R¹¹, NR¹⁰SO₂NR¹⁰R¹¹, NR¹⁰SO₂R²¹, S(O)_pR¹¹, SO₂NR¹⁰R¹¹, SiMe₃, C₂ to C₆ alkenyl, C₃ to C₁₁ cycloalkyl, C₄ to C₁₁ cycloalkylmethyl, C₆ to C₁₀ aryl, or C₇ to C₁₁ arylalkyl;
 35

- R^8 is selected from:
- H, R^6 ,
 - C_1 - C_{10} alkyl, substituted with 0-3 R^6 ,
 - C_2 - C_{10} alkenyl, substituted with 0-3 R^6 ,
 - 5 C_2 - C_{10} alkynyl, substituted with 0-3 R^6 ,
 - C_3 - C_8 cycloalkyl, substituted with 0-3 R^6 ,
 - C_5 - C_6 cycloalkenyl, substituted with 0-3 R^6 ,
 - aryl, substituted with 0-3 R^6 , or
 - 5-10 membered heterocyclic ring containing 1-3 N,
 - 10 O, or S heteroatoms, wherein said heterocyclic ring may be saturated, partially saturated, or fully unsaturated, said heterocyclic ring being substituted with 0-2 R^7 ;
- 15 R^9 is selected from H, hydroxy, C_1 - C_{10} alkoxy, nitro, $N(R^{10})R^{11}$, $-N(R^{16})R^{17}$, OR^{22} , C_1 - C_{10} alkyl substituted with 0-3 R^7 , aryl substituted with 0-3 R^7 , heteroaryl substituted with 0-3 R^7 , C_1 - C_{10} alkylcarbonyl; aryl(C_0 - C_6 alkyl)carbonyl, C_1 - C_{10} alkenyl, C_1 - C_{10} alkynyl, C_3 - C_{10} cycloalkyl, C_3 - C_{10} cycloalkylalkyl, aryl(C_1 - C_6 alkyl)-, heteroaryl(C_1 - C_6 alkyl)-, CO_2R^{18a} , $C(=O)R^{18a}$, $CONR^{18a}R^{20}$, SO_2R^{18a} , or $SO_2NR^{18a}R^{20}$, provided that any of the above
- 20 alkyl, cycloalkyl, aryl or heteroaryl groups may be unsubstituted or substituted independently with 0-2 R^7 ;
- 25 R^{10} is selected from H, C_1 - C_8 alkyl, C_3 - C_6 alkenyl, C_3 - C_{11} cycloalkyl, C_4 - C_{11} cycloalkylmethyl, C_6 - C_{10} aryl, C_7 - C_{11} arylalkyl, or C_1 - C_{10} alkyl substituted with 0-2 R^4 ;
- 30 R^{11} is selected from hydrogen, hydroxy, C_1 to C_8 alkyl, C_3 - C_6 alkenyl, C_3 to C_{11} cycloalkyl, C_4 to C_{11} cycloalkylmethyl, C_1 - C_6 alkoxy, benzyloxy, C_6 to C_{10} aryl, heteroaryl, heteroarylalkyl, C_7 to C_{11}
- 35

arylalkyl, adamantylmethyl, or C₁-C₁₀ alkyl substituted with 0-2 R⁴;

alternatively, R¹⁰ and R¹¹ when both are substituents on
 5 the same nitrogen atom (as in -NR¹⁰R¹¹) can be taken together with the nitrogen atom to which they are attached to form a heterocycle selected from:
 3-azabicyclononyl, 1,2,3,4-tetrahydro-1-quinoliny, 1,2,3,4-tetrahydro-2-isoquinoliny, 1-piperidiny,
 10 1-morpholiny, 1-pyrrolidiny, thiamorpholiny, thiazolidiny or 1-piperaziny; said heterocycle being optionally substituted with 0-3 groups selected from: C₁-C₆ alkyl, C₆-C₁₀ aryl, heteroaryl, C₇-C₁₁ arylalkyl, C₁-C₆ alkylcarbonyl, C₃-C₇
 15 cycloalkylcarbonyl, C₁-C₆ alkoxycarbonyl, C₇-C₁₁ arylalkoxycarbonyl, C₁-C₆ alkylsulfonyl or C₆-C₁₀ arylsulfonyl;

R¹² is selected from:
 20 H, C₁-C₁₀ alkyl, triphenylmethyl, methoxyphenyldiphenylmethyl, trimethylsilylethoxymethoxy (SEM), C₁-C₁₀ alkoxycarbonyl, C₁-C₁₀ alkylcarbonyl, C₁-C₁₀ alkylsulfonyl, aryl(C₁-C₁₀ alkyl)sulfonyl,
 25 arylsulfonyl, aryl(C₂-C₁₀ alkenyl)sulfonyl, heteroarylsulfonyl, aryl, C₂-C₆ alkenyl, C₃-C₁₁ cycloalkyl, C₄-C₁₁ cycloalkylalkyl, C₇-C₁₁ arylalkyl, C₇-C₁₁ arylcarbonyl, C₄-C₁₁ cycloalkoxycarbonyl, C₇-C₁₁ bicycloalkoxycarbonyl,
 30 C₇-C₁₁ aryloxycarbonyl, heteroarylcarbonyl, heteroarylalkylcarbonyl, or aryl(C₁-C₁₀ alkoxy)carbonyl; wherein said aryl groups are optionally substituted with 0-3 substituents selected from the group consisting of:
 35 C₁-C₄ alkyl, C₁-C₄ alkoxy, halo, CF₃, and NO₂;

- R^{13} is selected from: H, hydroxy, C_1 - C_{10} alkoxy, nitro,
 $N(R^{10})R^{11}$, $-N(R^{16})R^{17}$, C_1 - C_{10} alkyl substituted with
 0-3 R^7 , aryl substituted with 0-3 R^7 , heteroaryl
 substituted with 0-3 R^7 , or C_1 - C_{10} alkylcarbonyl;
- R^{14} is selected from H, C_1 - C_{10} alkyl, C_2 - C_{10} alkenyl,
 C_2 - C_{10} alkynyl, C_1 - C_{10} alkoxy, aryl, heteroaryl or
 C_1 - C_{10} alkoxycarbonyl, CO_2R^{10} or $-C(=O)N(R^{10})R^{11}$;
- R^{15} is selected from:
 H, R^6 , $-CO_2R^{10}$, $-C(=O)N(R^{10})R^{11}$;
 C_1 - C_{10} alkoxycarbonyl substituted with 0-2 R^6 ;
 C_1 - C_{10} alkyl, substituted with 0-3 R^6 ;
 C_2 - C_{10} alkenyl, substituted with 0-3 R^6 ;
 C_1 - C_{10} alkoxy, substituted with 0-3 R^6 ;
 aryl, substituted with 0-3 R^6 ; or
 5-10 membered heterocyclic ring containing 1-3 N,
 O, or S heteroatoms, wherein said heterocyclic
 ring may be saturated, partially saturated, or
 fully unsaturated, said heterocyclic ring
 being substituted with 0-2 R^7 ;
- R^{16} is selected from:
 $-C(=O)-O-R^{18a}$,
 $-C(=O)-R^{18b}$,
 $-C(=O)N(R^{18b})_2$,
 $-C(=O)NHSO_2R^{18a}$,
 $-C(=O)NHC(=O)R^{18b}$,
 $-C(=O)NHC(=O)OR^{18a}$,
 $-C(=O)NHSO_2NHR^{18b}$,
 $-C(=S)-NH-R^{18b}$,
 $-NH-C(=O)-O-R^{18a}$,
 $-NH-C(=O)-R^{18b}$,
 $-NH-C(=O)-NH-R^{18b}$,
 $-SO_2-O-R^{18a}$,

-SO₂-R^{18a},
 -SO₂-N(R^{18b})₂,
 -SO₂-NHC(=O)OR^{18b};

5 R¹⁷ is selected from: H, C₁-C₁₀ alkyl, C₂-C₆ alkenyl, C₃-C₁₁ cycloalkyl, C₄-C₁₅ cycloalkylalkyl, aryl, aryl(C₁-C₁₀ alkyl)-;

R^{18a} is selected from:

10 C₁-C₈ alkyl substituted with 0-2 R¹⁹,
 C₂-C₈ alkenyl substituted with 0-2 R¹⁹,
 C₂-C₈ alkynyl substituted with 0-2 R¹⁹,
 C₃-C₈ cycloalkyl substituted with 0-2 R¹⁹,
 aryl substituted with 0-4 R¹⁹,
 15 aryl(C₁-C₆ alkyl)- substituted with 0-4 R¹⁹,
 a 5-10 membered heterocyclic ring system having 1-3
 heteroatoms selected independently from O, S,
 and N, said heterocyclic ring being
 substituted with 0-4 R¹⁹,
 20 C₁-C₆ alkyl substituted with a 5-10 membered
 heterocyclic ring system having 1-3
 heteroatoms selected independently from O, S,
 and N, said heterocyclic ring being
 substituted with 0-4 R¹⁹;

25

R^{18b} is selected from R^{18a} or H;

R¹⁹ is selected from H, halogen, CF₃, CO₂H, CN, NO₂,
 NR¹¹R¹², C₁-C₈ alkyl, C₂-C₆ alkenyl, C₂-C₆ alkynyl,
 30 C₃-C₁₁ cycloalkyl, C₄-C₁₁ cycloalkylalkyl,
 aryl(C₁-C₆ alkyl)-, C₁-C₆ alkoxy, OCF₃, or C₁-C₄
 alkoxycarbonyl, aryl, -O-aryl, -SO₂-aryl,
 heteroaryl, or -SO₂-heteroaryl, wherein said aryl
 and heteroaryl groups may be substituted with 0-4

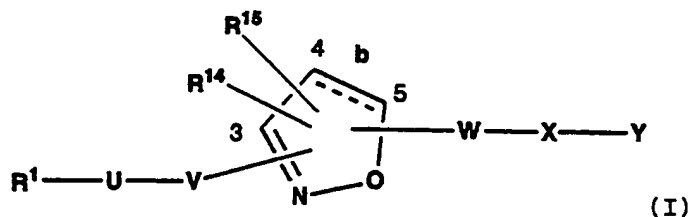
groups selected from hydrogen, halogen, CF₃, C₁-C₃ alkyl, or C₁-C₃ alkoxy;

- 5 R²⁰ is selected from hydroxy, C₁ to C₁₀ alkyloxy, C₃ to C₁₁ cycloalkyloxy, C₆ to C₁₀ aryloxy, C₇ to C₁₁ arylalkyloxy, C₃ to C₁₀ alkylcarbonyloxyalkyloxy, C₃ to C₁₀ alkoxy carbonyloxyalkyloxy, C₂ to C₁₀ alkoxy carbonylalkyloxy, C₅ to C₁₀ cycloalkylcarbonyloxyalkyloxy, C₅ to C₁₀ cycloalkoxy carbonyloxyalkyloxy, C₅ to C₁₀ cycloalkoxy carbonylalkyloxy, C₇ to C₁₁ aryloxy carbonylalkyloxy, C₈ to C₁₂ aryloxy carbonyloxyalkyloxy, C₈ to C₁₂ arylcarbonyloxyalkyloxy, C₅ to C₁₀ alkoxyalkylcarbonyloxyalkyloxy, C₅ to C₁₀ (5-alkyl-1,3-dioxo-cyclopenten-2-one-yl)methyloxy, C₁₀ to C₁₄ (5-aryl-1,3-dioxo-cyclopenten-2-one-yl)methyloxy, (R¹¹) (R¹²)N-(C₁-C₁₀ alkoxy)-;
- 20 R²¹ is selected from: C₁-C₈ alkyl, C₂-C₆ alkenyl, C₃-C₁₁ cycloalkyl, C₄-C₁₁ cycloalkylmethyl, C₆-C₁₀ aryl, C₇-C₁₁ arylalkyl, or C₁-C₁₀ alkyl substituted with 0-2 R⁵;
- 25 R²² is selected from:
- 30 -C(=O)-R^{18b},
 -C(=O)N(R^{18b})₂,
 -C(=O)NHSO₂R^{18a},
 -C(=O)NHC(=O)R^{18b},
 -C(=O)NHC(=O)OR^{18a},
 -C(=O)NHSO₂NHR^{18b},
 -C(=S)-NH-R^{18b},
 -SO₂-R^{18a},
 -SO₂-N(R^{18b})₂,
 -SO₂-NHC(=O)OR^{18b};
- 35

- m is 0-2;
 n is 0-4;
 p is 0-2;
 5 q is 0-4;
 r is 0-2;
 s is 0-1;

with the following provisos:

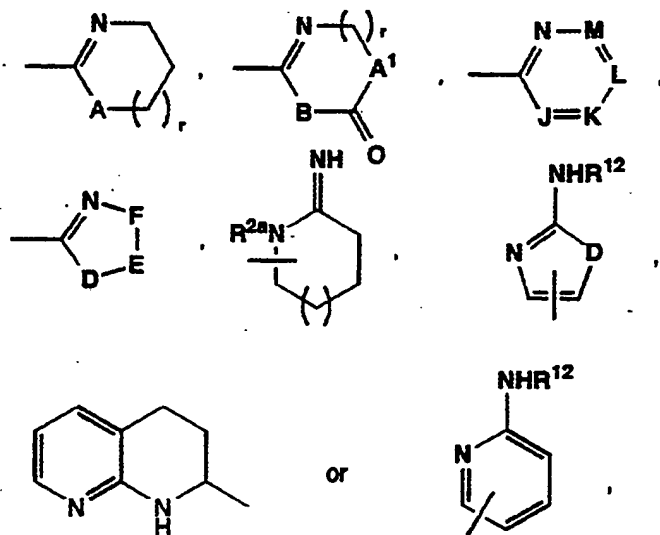
- 10 (1) when b is a double bond, only one of R^{14} or R^{15} is present and Q and U are not $-(CH_2)-$; and
 (2) n, m and q are chosen such that the number of atoms connecting R^1 and Y is in the range of 8-14; and
 15 (3) when V is $-(phenyl)-Q-$, then either: U is not a direct bond (i.e., U is not $-(CH_2)_n-$ where $n = 0$) or Q is not a direct bond (i.e., Q is not $-(CH_2)_n-$ where $n = 0$).
 20 [2] Preferred compounds of the present invention are compounds of Formula I:



- 25 including stereoisomeric forms thereof, or mixtures of stereoisomeric forms thereof, or pharmaceutically acceptable salt or prodrug forms thereof wherein:

- 30 b, the bond between carbon atoms numbered 4 and 5, is a carbon-carbon single or double bond;

R¹ is selected from:



5 A is selected from -CH₂-, or -N(R¹²)-;

A¹ and B are independently -CH₂- or -N(R¹⁰)-;

D is -N(R¹²)-, or -S-;

10

E-F is -C(R²)=C(R³)-, or -C(R²)₂C(R³)₂-;

J is either -C(R²)- or -N-, and K, L and M are independently selected from -C(R²)- or -C(R³)-;

15

R² and R³ are independently selected from: H, C₁-C₄ alkoxy, NR¹¹R¹², =NR¹², halogen, NO₂, CN, CF₃, C₁-C₆ alkyl, C₃-C₆ alkenyl, C₃-C₇ cycloalkyl, C₄-C₁₁ cycloalkylalkyl, C₆-C₁₀ aryl substituted with 0-4 R⁷, C₇-C₁₁ arylalkyl, C₂-C₇ alkylcarbonyl, C₁-C₄ alkoxy carbonyl, or C₇-C₁₁ arylcarbonyl;

20

alternatively, R² and R³ when substituents on adjacent atoms, can be taken together when

substituents on adjacent atoms, with the carbon atoms to which they are attached, to form a 5-7 membered carbocyclic or 5-7 membered heterocyclic with the carbon atoms to which they are attached, aromatic or nonaromatic ring system, said carbocyclic or heterocyclic ring being optionally substituted with 0-2 groups selected from C₁-C₄ alkyl, C₁-C₄ alkoxy, halo, cyano, amino, CF₃ or NO₂;

10 R^{2a} is absent or R¹²;

U is selected from:

- (CH₂)_n-,
- (CH₂)_nO(CH₂)_m-,
- 15 - (CH₂)_nN(R¹²)(CH₂)_m-,
- (CH₂)_nC(=O)(CH₂)_m-,
- (CH₂)_nS(O)_p(CH₂)_m-,
- (CH₂)_nNHNH(CH₂)_m-,
- N(R¹⁰)C(=O)-, or
- 20 -C(=O)N(R¹⁰)-;
- N(R¹⁰)S(O)_p-, or

V is selected from:

- (CH₂)_n-,
- 25 - (C₁-C₆ alkylene)-Q-, substituted with 0-3 groups independently selected from R¹³,
- (C₂-C₇ alkenylene)-Q-, substituted with 0-3 groups independently selected from R¹³,
- (C₂-C₇ alkynylene)-Q-, substituted with 0-3 groups independently selected from R¹³,
- 30 - (phenyl)-Q-, said phenyl substituted with 0-2 groups independently selected from R¹³,
- (pyridyl)-Q-, said pyridyl substituted with 0-2 groups independently selected from R¹³, or

-(pyridazinyl)-Q-, said pyridazinyl substituted
with 0-2 groups independently selected from
R¹³;

5 Q is selected from:

- (CH₂)_n-,
- (CH₂)_nO(CH₂)_m-,
- (CH₂)_nN(R¹²)(CH₂)_m-,
- (CH₂)_nC(=O)(CH₂)_m-,
- 10 - (CH₂)_nS(O)_p(CH₂)_m-,
- (CH₂)_nNHNNH(CH₂)_m-,
- N(R¹⁰)C(=O)-, or
- C(=O)N(R¹⁰)-;

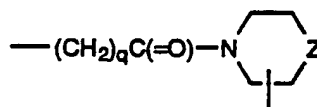
15 W is selected from:

- (C(R⁴)₂)_qC(=O)N(R¹⁰)- or,
- C(=O)-N(R¹⁰)-(C(R⁴)₂)_q-;

X is selected from:

- 20 a single bond (i.e., X is absent) or,
- (C(R⁴)₂)_q-[C(R⁴)(R⁸)]_s-C(R⁴)(R⁹)-;

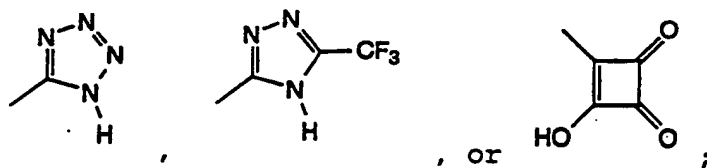
alternatively, W is



25 and X is either absent or -CH₂-

Y is selected from:

- COR²⁰, -SO₃H, -PO₃H, -CONHNHSO₂CF₃,
- CONHSO₂R^{18a}, -CONHSO₂NHR^{18b}, -NHCOCF₃,
- 30 -NHCONHSO₂R^{18a}, -NHSO₂R^{18a}, -OPO₃H₂, -OSO₃H,
- PO₃H₂, -SO₃H, -SO₂NHCOR^{18a}, -SO₂NHCO₂R^{18a}, or



Z is selected from $-\text{CH}(\text{R}^9)-$, or $-\text{N}(\text{R}^{16})-$;

- 5 R^4 is selected from H, C_1 - C_{10} alkyl, C_1 - C_{10} alkylcarbonyl, aryl, arylalkyl, cycloalkyl, or cycloalkylalkyl;

10 alternatively, two R^4 groups on adjacent carbon atoms may join to form a bond, thereby to form a carbon-carbon double or triple bond between the adjacent carbon atoms;

R^6 is selected from:

- 15 H, C_1 - C_{10} alkyl, hydroxy, C_1 - C_{10} alkoxy, nitro, C_1 - C_{10} alkylcarbonyl, $-\text{N}(\text{R}^{11})\text{R}^{12}$, cyano, halo, CF_3 , CHO , $\text{CO}_2\text{R}^{18b}$, $\text{C}(=\text{O})\text{R}^{18b}$, $\text{CONR}^{17}\text{R}^{18b}$, $\text{OC}(=\text{O})\text{R}^{10}$, OR^{10} , $\text{OC}(=\text{O})\text{NR}^{10}\text{R}^{11}$, $\text{NR}^{10}\text{C}(=\text{O})\text{R}^{10}$, $\text{NR}^{10}\text{C}(=\text{O})\text{OR}^{21}$, $\text{NR}^{10}\text{C}(=\text{O})\text{NR}^{10}\text{R}^{11}$, $\text{NR}^{10}\text{SO}_2\text{NR}^{10}\text{R}^{11}$, $\text{NR}^{10}\text{SO}_2\text{R}^{21}$, $\text{S}(\text{O})_p\text{R}^{11}$, $\text{SO}_2\text{NR}^{10}\text{R}^{11}$,

- 20 C_6 to C_{10} aryl optionally substituted with 0-3 groups selected from halogen, C_1 - C_6 alkoxy, C_1 - C_6 alkyl, CF_3 , $\text{S}(\text{O})_m\text{Me}$, or $-\text{NMe}_2$;

- 25 C_7 to C_{11} arylalkyl, said aryl being optionally substituted with 1-3 groups selected from halogen, C_1 - C_6 alkoxy, C_1 - C_6 alkyl, CF_3 , $\text{S}(\text{O})_p\text{Me}$, or $-\text{NMe}_2$,

- 30 a 5-10 membered heterocyclic ring containing 1-3 N, O, or S heteroatoms, wherein said heterocyclic ring may be saturated, partially saturated, or fully unsaturated, said heterocyclic ring being substituted with 0-2 R^7 ;

- R⁷ is selected from selected from H, C₁-C₄ alkyl, hydroxy, C₁-C₄ alkoxy, C₆-C₁₀ aryl, C₇-C₁₁ arylalkyl, (C₁-C₄ alkyl)carbonyl, CO₂R^{18a}, SO₂R¹¹, SO₂NR¹⁰R¹¹, OR¹⁰, or N(R¹¹)R¹²;
- 5 R⁸ is selected from:
 H, CO₂R^{18a}, C(=O)R^{18a}, or CONR¹⁷R^{18a}
 C₁-C₁₀ alkyl, substituted with 0-1 R⁶,
 C₂-C₁₀ alkenyl, substituted with 0-1 R⁶,
 10 C₂-C₁₀ alkynyl, substituted with 0-1 R⁶,
 C₃-C₈ cycloalkyl, substituted with 0-1 R⁶,
 C₅-C₆ cycloalkenyl, substituted with 0-1 R⁶,
 aryl, substituted with 0-3 R⁶, or
 5-10 membered heterocyclic ring containing 1-3 N,
 15 O, or S heteroatoms, wherein said heterocyclic ring may be saturated, partially saturated, or fully unsaturated, said heterocyclic ring being substituted with 0-2 R⁷;
- 20 R⁹ is selected from H, hydroxy, C₁-C₁₀ alkoxy, nitro, N(R¹⁰)R¹¹, -N(R¹⁶)R¹⁷, OR²², C₁-C₁₀ alkyl substituted with 0-3 R⁷, aryl substituted with 0-3 R⁷, heteroaryl substituted with 0-3 R⁷, C₁-C₁₀ alkylcarbonyl; aryl(C₀-C₆ alkyl)carbonyl, C₁-C₁₀ alkenyl, C₁-C₁₀ alkynyl, C₃-C₁₀ cycloalkyl, C₃-C₁₀ cycloalkylalkyl, aryl(C₁-C₆ alkyl)-, heteroaryl(C₁-C₆ alkyl)-, CO₂R^{18a}, C(=O)R^{18a}, CONR^{18a}R²⁰, SO₂R^{18a}, or SO₂NR^{18a}R²⁰, provided that any of the above
 25 alkyl, cycloalkyl, aryl or heteroaryl groups may
 30 be unsubstituted or substituted independently with 0-2 R⁷;
- R¹⁰ is selected from H, C₁-C₈ alkyl, C₃-C₆ alkenyl, C₃-C₁₁ cycloalkyl, C₄-C₁₁ cycloalkylmethyl, C₆-C₁₀

aryl, C₇-C₁₁ arylalkyl, or C₁-C₁₀ alkyl substituted with 0-2 R⁴;

5 R¹¹ is selected from hydrogen, hydroxy, C₁ to C₈ alkyl, C₃-C₆ alkenyl, C₃ to C₁₁ cycloalkyl, C₄ to C₁₁ cycloalkylmethyl, C₁-C₆ alkoxy, benzyloxy, C₆ to C₁₀ aryl, heteroaryl, heteroarylalkyl, C₇ to C₁₁ arylalkyl, adamantylmethyl, or C₁-C₁₀ alkyl substituted with 0-2 R⁴;

10 alternatively, R¹⁰ and R¹¹ when both are substituents on the same nitrogen atom (as in -NR¹⁰R¹¹) can be taken together with the nitrogen atom to which they are attached to form a heterocycle selected from:

15 3-azabicyclononyl, 1,2,3,4-tetrahydro-1-quinolinyl, 1,2,3,4-tetrahydro-2-isoquinolinyl, 1-piperidinyl, 1-morpholinyl, 1-pyrrolidinyl, thiamorpholinyl, thiazolidinyl or 1-piperazinyl; said heterocycle being optionally substituted with 0-3 groups

20 selected from: C₁-C₆ alkyl, C₆-C₁₀ aryl, heteroaryl, C₇-C₁₁ arylalkyl, C₁-C₆ alkylcarbonyl, C₃-C₇ cycloalkylcarbonyl, C₁-C₆ alkoxy carbonyl, C₇-C₁₁ arylalkoxy carbonyl, C₁-C₆ alkylsulfonyl or C₆-C₁₀ arylsulfonyl;

25 R¹² is selected from:

H, C₁-C₆ alkyl, triphenylmethyl, methoxyphenyldiphenylmethyl, trimethylsilylethoxymethoxy (SEM), (C₁-C₆ alkyl)carbonyl, (C₁-C₆ alkoxy)carbonyl; (C₁-C₆ alkyl)aminocarbonyl, C₃-C₆ alkenyl, C₃-C₇ cycloalkyl, C₄-C₁₁ cycloalkylalkyl, aryl, heteroaryl(C₁-C₆ alkyl)carbonyl, heteroarylcarbonyl, aryl C₁-C₆ alkyl, (C₁-C₆ alkyl)carbonyl, or arylcarbonyl, C₁-C₆

30

35

- alkylsulfonyl, arylsulfonyl, aryl(C₁-C₆ alkyl)sulfonyl, heteroarylsulfonyl, heteroaryl(C₁-C₆ alkyl)sulfonyl, aryloxycarbonyl, or aryl(C₁-C₆ alkoxy)carbonyl, wherein said aryl groups are substituted with 0-2 substituents selected from the group consisting of C₁-C₄ alkyl, C₁-C₄ alkoxy, halo, CF₃, and nitro;
- 5
- R¹³ is selected from: H, hydroxy, C₁-C₁₀ alkoxy, nitro, N(R¹⁰)R¹¹, -N(R¹⁶)R¹⁷, C₁-C₁₀ alkyl substituted with 0-3 R⁷, aryl substituted with 0-3 R⁷, heteroaryl substituted with 0-3 R⁷, or C₁-C₁₀ alkylcarbonyl;
- 10
- R¹⁴ is selected from H, C₁-C₁₀ alkyl, C₂-C₁₀ alkenyl, C₂-C₁₀ alkynyl, C₁-C₁₀ alkoxy, aryl, heteroaryl or C₁-C₁₀ alkoxycarbonyl, CO₂R¹⁰ or -C(=O)N(R¹⁰)R¹¹;
- 15
- R¹⁵ is selected from: H, CO₂R^{18a}, C(=O)R^{18a}, CONR^{18a}R¹⁷, -SO₂R^{18a}, -SO₂NR^{18a}R¹⁷, C₁-C₆ alkyl substituted with 0-1 R⁹, C₃-C₆ alkenyl substituted with 0-1 R⁹, C₃-C₇ cycloalkyl substituted with 0-1 R⁹, C₄-C₁₁ cycloalkylalkyl substituted with 0-1 R⁹, aryl substituted with 0-1 R⁹ or 0-2 R⁷, or aryl(C₁-C₆ alkyl)- substituted with 0-1 R⁹ or 0-2 R⁷;
- 20
- R¹⁶ is selected from:
- 25
- C(=O)-O-R^{18a},
- C(=O)-R^{18b},
- C(=O)N(R^{18b})₂,
- 30 -C(=O)NHSO₂R^{18a},
- C(=O)NHC(=O)R^{18b},
- C(=O)NHC(=O)OR^{18a},
- C(=O)NHSO₂NHR^{18b},
- SO₂-R^{18a},
- 35 -SO₂-N(R^{18b})₂ or,
- SO₂-NHC(=O)OR^{18b};

R¹⁷ is selected from: H, C₁-C₆ alkyl, C₃-C₇ cycloalkyl, C₄-C₁₁ cycloalkylalkyl, aryl, aryl(C₁-C₆ alkyl)-, or heteroaryl(C₁-C₆ alkyl);

5

R^{18a} is selected from: C₁-C₈ alkyl, C₃-C₁₁ cycloalkyl, aryl(C₁-C₆ alkyl)-, (C₁-C₆ alkyl)aryl, heteroaryl(C₁-C₆ alkyl)-, (C₁-C₆ alkyl)heteroaryl, biaryl(C₁-C₆ alkyl), heteroaryl, or aryl, wherein
 10 said aryl or heteroaryl groups are optionally substituted with 0-4 R¹⁹;

R^{18b} is selected from R^{18a} or H;

15 R¹⁹ is selected from H, halogen, CF₃, CO₂H, CN, NO₂, NR¹¹R¹², C₁-C₈ alkyl, C₂-C₆ alkenyl, C₂-C₆ alkynyl, C₃-C₁₁ cycloalkyl, C₄-C₁₁ cycloalkylalkyl, aryl(C₁-C₆ alkyl)-, C₁-C₆ alkoxy, OCF₃, or C₁-C₄ alkoxycarbonyl, aryl, -O-aryl, -SO₂-aryl,
 20 heteroaryl, or -SO₂-heteroaryl, wherein said aryl and heteroaryl groups may be substituted with 0-4 groups selected from hydrogen, halogen, CF₃, C₁-C₃ alkyl, or C₁-C₃ alkoxy;

25 R²⁰ is selected from hydroxy, C₁ to C₁₀ alkyloxy, C₃ to C₁₁ cycloalkyloxy, C₆ to C₁₀ aryloxy, C₇ to C₁₁ aralkyloxy, C₃ to C₁₀ alkylcarbonyloxyalkyloxy, C₃ to C₁₀ alkoxycarbonyloxyalkyloxy, C₂ to C₁₀ alkoxycarbonylalkyloxy, C₅ to C₁₀
 30 cycloalkylcarbonyloxyalkyloxy, C₅ to C₁₀ cycloalkoxycarbonyloxyalkyloxy, C₅ to C₁₀ cycloalkoxycarbonylalkyloxy, C₇ to C₁₁ aryloxycarbonylalkyloxy, C₈ to C₁₂ aryloxycarbonyloxyalkyloxy, C₈ to C₁₂
 35 arylcarbonyloxyalkyloxy, C₅ to C₁₀ alkoxyalkylcarbonyloxyalkyloxy, C₅ to C₁₀ (5-alkyl-

1,3-dioxa-cyclopenten-2-one-yl)methyloxy, C₁₀ to C₁₄
 (5-aryl-1,3-dioxa-cyclopenten-2-one-yl)methyloxy,
 or (R¹¹)(R¹²)N-(C₁-C₁₀ alkoxy)-;

5 R²¹ is selected from: C₁-C₈ alkyl, C₂-C₆ alkenyl, C₃-C₁₁
 cycloalkyl, C₄-C₁₁ cycloalkylmethyl, C₆-C₁₀ aryl,
 C₇-C₁₁ arylalkyl, or C₁-C₁₀ alkyl substituted with
 0-2 R⁷;

10 R²² is selected from:

-C(=O)-R^{18b},
 -C(=O)N(R^{18b})₂,
 -C(=O)NHSO₂R^{18a},
 -C(=O)NHC(=O)R^{18b},
 15 -C(=O)NHC(=O)OR^{18a} or,
 -C(=O)NHSO₂NHR^{18b},

m is 0-2;
 n is 0-4;
 20 p is 0-2;
 q is 0-4;
 r is 0-2;
 s is 0-1;

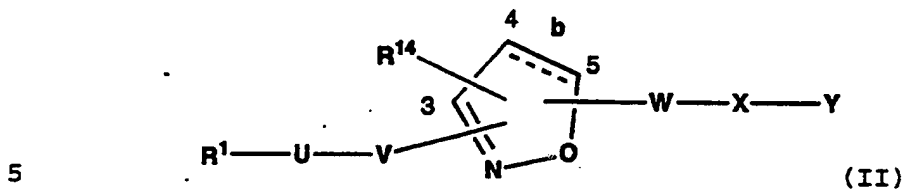
25 with the following provisos:

(1) when b is a double bond, only one of R¹⁴ or R¹⁵
 is present and Q and U are not -(CH₂)-; and

(2) n, m and q are chosen such that the number of
 atoms connecting R¹ and Y is in the range of
 30 8-14; and

(3) when V is -(phenyl)-Q-, then either: U is not a
 direct bond (i.e., U is not -(CH₂)_n- where n =
 0) or Q is not a direct bond (i.e., Q is not
 35 -(CH₂)_n- where n = 0).

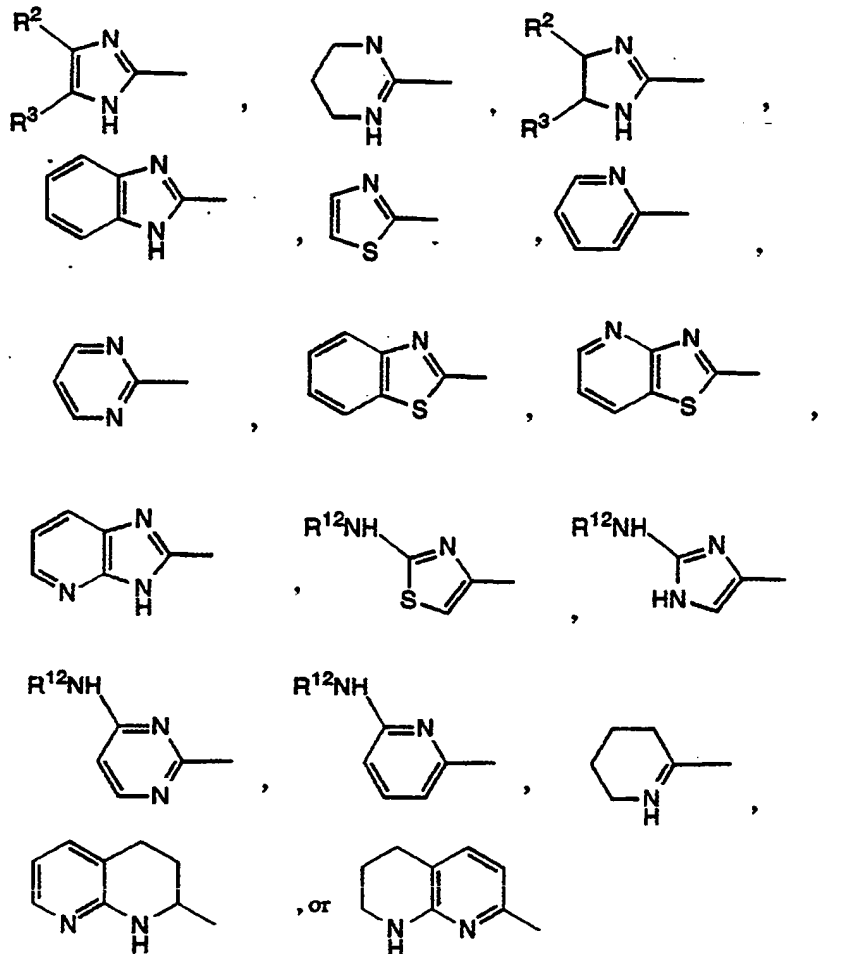
[3] Further preferred compounds of the above invention are compounds of Formula II:



including enantiomeric or diastereomeric forms thereof,
 or mixtures of enantiomeric or diastereomeric forms
 thereof, or pharmaceutically acceptable salt or prodrug
 10 forms thereof wherein:

b, the bond between carbon atoms numbered 4 and 5, is a
 carbon-carbon single or double bond;

R¹ is selected from:



5

R² and R³ are independently selected from: H, C₁-C₄
 alkoxy, NR¹¹R¹², halogen, NO₂, CN, CF₃, C₁-C₆ alkyl,
 C₃-C₆ alkenyl, C₃-C₇ cycloalkyl, C₄-C₁₁
 cycloalkylalkyl, C₆-C₁₀ aryl substituted with 0-2
 10 R⁷, C₇-C₁₁ arylalkyl, C₂-C₇ alkylcarbonyl, or C₇-C₁₁
 arylcarbonyl;

15

alternatively, R² and R³ can be taken together with
 the carbon atoms to which they are attached to form
 a 5-7 membered carbocyclic or 5-7 membered

heterocyclic aromatic or nonaromatic ring system,
said carbocyclic or heterocyclic ring being
optionally substituted with 0-2 R^7 ;

5 U is selected from:

- $(CH_2)_n$ -,
- $N(R^{12})(CH_2)_m$ -,
- $N(R^{10})C(=O)$ -, or
- $C(=O)N(R^{10})$ -;
- 10 - $N(R^{10})S(O)_p$ -, or

V is selected from:

- $(CH_2)_n$ -,
- $(C_1-C_6 \text{ alkylene})-Q$ -, substituted with 0-3 groups
15 independently selected from R^{13} ,
- $(C_2-C_7 \text{ alkenylene})-Q$ -, substituted with 0-3 groups
independently selected from R^{13} ,
- $(C_2-C_7 \text{ alkynylene})-Q$ -, substituted with 0-3 groups
independently selected from R^{13} ,
- 20 - $(\text{phenyl})-Q$ -, said phenyl substituted with 0-2
groups independently selected from R^{13} ,
- $(\text{pyridyl})-Q$ -, said pyridyl substituted with 0-2
groups independently selected from R^{13} , or
- $(\text{pyridazinyl})-Q$ -, said pyridazinyl substituted
25 with 0-2 groups independently selected from
 R^{13} ;

Q is selected from:

- $(CH_2)_n$ -,
- 30 - $(CH_2)_nO(CH_2)_m$ -,
- $(CH_2)_nN(R^{12})(CH_2)_m$ -,
- $N(R^{10})C(=O)$ -, or
- $C(=O)N(R^{10})$ -;

35 W is selected from:

- $(CH_2)_qC(=O)N(R^{10})$ -, or

$-C(=O)-N(R^{10})-(CH_2)_q-$;

X is $-(CH_2)_q-CH(R^8)-CH(R^9)-$;

5 Y is $-COR^{20}$;

R^6 is selected from:

H, C_1-C_4 alkyl, hydroxy, C_1-C_4 alkoxy, nitro, C_1-C_6
 alkylcarbonyl, $-N(R^{11})R^{12}$, cyano, halo, CF_3 ,
 10 $-S(O)_pR^{10}$, CO_2R^{18a} , $CONR^{17}R^{18a}$, $-COR^{18a}$, OR^{10} ,
 C_6 to C_{10} aryl optionally substituted with 0-3
 groups selected from halogen, C_1-C_6 alkoxy,
 C_1-C_6 alkyl, CF_3 , $S(O)_mMe$, or $-NMe_2$;
 a heterocyclic ring system selected from pyridinyl,
 15 furanyl, thiazolyl, thienyl, pyrrolyl,
 pyrazolyl, triazolyl, imidazolyl,
 benzofuranyl, indolyl, indolinyl, quinolinyl,
 isoquinolinyl, benzimidazolyl, piperidinyl,
 tetrahydrofuranyl, pyranal, 3H-indolyl,
 20 carbazolyl, pyrrolidinyl, piperidinyl,
 isoxazolinyl, isoxazolyl, or morpholinyl;

R^7 is selected from:

H, C_1-C_4 alkyl, hydroxy, C_1-C_4 alkoxy, nitro, C_1-C_4
 25 alkylcarbonyl, $-N(R^{11})R^{12}$, CO_2R^{18a} , SO_2R^{11} ,
 $SO_2NR^{10}R^{11}$ or OR^{10} ;

R^8 is selected from:

H, $CONR^{17}R^{18a}$, $-CO_2R^{18a}$, $-COR^{18a}$
 30 C_1-C_{10} alkyl, substituted with 0-1 R^6 ,
 C_2-C_{10} alkenyl, substituted with 0-1 R^6 ,
 C_2-C_{10} alkynyl, substituted with 0-1 R^6 ,
 C_3-C_8 cycloalkyl, substituted with 0-1 R^6 ,
 aryl, substituted with 0-1 R^6 or,

a heterocyclic ring system selected from pyridinyl,
furanyl, thiazolyl, thienyl, pyrrolyl,
pyrazolyl, triazolyl, imidazolyl,
benzofuranyl, indolyl, indolinyl, quinolinyl,
5 isoquinolinyl, benzimidazolyl, piperidinyl,
tetrahydrofuranyl, pyranyl, 3H-indolyl,
carbazolyl, pyrrolidinyl, piperidinyl,
isoxazolinyl, isoxazolyl or morpholinyl, said
heterocycle optionally substituted with 0-2
10 R⁷;

R⁹ is selected from: H or -N(R¹⁶)R¹⁷;

R¹⁰ is selected from H or C₁-C₁₀ alkyl, or C₇-C₁₀
15 arylalkyl;

R¹¹ is selected from hydrogen, hydroxy, C₁ to C₈ alkyl,
C₃-C₆ alkenyl, C₃ to C₁₁ cycloalkyl, C₄ to C₁₁
cycloalkylmethyl, C₁-C₆ alkoxy, benzyloxy, C₆ to C₁₀
20 aryl, heteroaryl, heteroarylalkyl, C₇ to C₁₁
arylalkyl, adamantylmethyl, or C₁-C₁₀ alkyl
substituted with 0-2 R⁴;

alternatively, R¹⁰ and R¹¹ when both are substituents on
25 the same nitrogen atom (as in -NR¹⁰R¹¹) can be taken
together with the nitrogen atom to which they are
attached to form a heterocycle selected from:
3-azabicyclononyl, 1,2,3,4-tetrahydro-1-quinolinyl,
1,2,3,4-tetrahydro-2-isoquinolinyl, 1-piperidinyl,
30 1-morpholinyl, 1-pyrrolidinyl, thiamorpholinyl,
thiazolidinyl or 1-piperazinyl; said heterocycle
being optionally substituted with 1-3 groups
selected from: C₁-C₆ alkyl, C₆-C₁₀ aryl, heteroaryl,
C₇-C₁₁ arylalkyl, C₁-C₆ alkylcarbonyl, C₃-C₇
35 cycloalkylcarbonyl, C₁-C₆ alkoxy carbonyl, C₇-C₁₁

arylalkoxycarbonyl, C₁-C₆ alkylsulfonyl or C₆-C₁₀ alkylsulfonyl;

R¹² is selected from:

- 5 H, C₁-C₆ alkyl, triphenylmethyl, methoxyphenyldiphenylmethyl, trimethylsilylethoxymethoxy (SEM), C₁-C₄ alkoxycarbonyl, C₁-C₆ alkylcarbonyl, C₁-C₆ alkylsulfonyl, aryl(C₁-C₄ alkyl)sulfonyl, 10 arylsulfonyl, aryl, heteroarylcarbonyl, or heteroarylalkylcarbonyl, wherein said aryl groups are substituted with 0-3 substituents selected from the group consisting of: C₁-C₄ alkyl, C₁-C₄ alkoxy, halo, CF₃, and NO₂;

15

R¹³ is selected from: H, hydroxy, C₁-C₁₀ alkoxy, N(R¹⁰)R¹¹, -N(R¹⁶)R¹⁷, C₁-C₁₀ alkyl substituted with 0-3 R⁷, aryl substituted with 0-3 R⁷, heteroaryl substituted with 0-3 R⁷, or C₁-C₁₀ alkylcarbonyl;

20

R¹⁴ is selected from H, C₁-C₁₀ alkyl, C₂-C₁₀ alkenyl, C₂-C₁₀ alkynyl, C₁-C₁₀ alkoxy, aryl, heteroaryl or C₁-C₁₀ alkoxycarbonyl, CO₂R¹⁰ or -C(=O)N(R¹⁰)R¹¹;

25 R¹⁶ is selected from:

-C(=O)-O-R^{18a},
-C(=O)-R^{18b},
-SO₂-R^{18a} or,
-SO₂-N(R^{18b})₂;

30

R¹⁷ is selected from H or C₁-C₄ alkyl;

R^{18a} is selected from: C₁-C₈ alkyl, C₃-C₁₁ cycloalkyl, aryl(C₁-C₆ alkyl)-, (C₁-C₆ alkyl)aryl,

35 heteroaryl(C₁-C₆ alkyl)-, (C₁-C₆ alkyl)heteroaryl, biaryl(C₁-C₆ alkyl), heteroaryl, or aryl, wherein

said aryl or heteroaryl groups are optionally substituted with 0-2 R¹⁹;

R^{18b} is selected from R^{18a} or H;

5

R¹⁹ is selected from H, halogen, CF₃, CO₂H, CN, NO₂, NR¹¹R¹², C₁-C₈ alkyl, C₂-C₆ alkenyl, C₂-C₆ alkynyl, C₃-C₁₁ cycloalkyl, C₄-C₁₁ cycloalkylalkyl, aryl(C₁-C₆ alkyl)-, C₁-C₆ alkoxy, OCF₃, or C₁-C₄ alkoxy carbonyl, aryl, -O-aryl, -SO₂-aryl, heteroaryl, or -SO₂-heteroaryl, wherein said aryl and heteroaryl groups may be substituted with 0-4 groups selected from hydrogen, halogen, CF₃, C₁-C₃ alkyl, or C₁-C₃ alkoxy;

10

15

R²⁰ is selected from:

hydroxy;

C₁ to C₁₀ alkoxy;

methylcarbonyloxymethoxy-;

20

ethylcarbonyloxymethoxy-;

t-butylcarbonyloxymethoxy-;

cyclohexylcarbonyloxymethoxy-;

1-(methylcarbonyloxy)ethoxy-;

1-(ethylcarbonyloxy)ethoxy-;

25

1-(t-butylcarbonyloxy)ethoxy-;

1-(cyclohexylcarbonyloxy)ethoxy-;

i-propyloxycarbonyloxymethoxy-;

t-butyloxycarbonyloxymethoxy-;

1-(i-propyloxycarbonyloxy)ethoxy-;

30

1-(cyclohexyloxycarbonyloxy)ethoxy-;

1-(t-butyloxycarbonyloxy)ethoxy-;

dimethylaminoethoxy-;

diethylaminoethoxy-;

(5-methyl-1,3-dioxacyclopenten-2-on-4-yl)methoxy-;

(5-(t-butyl)-1,3-dioxacyclopenten-2-on-4-yl)methoxy-;

(1,3-dioxa-5-phenyl-cyclopenten-2-on-4-yl)methoxy-
or;

5 1-(2-(2-methoxypropyl)carbonyloxy)ethoxy-;

R²¹ is selected from C₁-C₈ alkyl, C₂-C₆ alkenyl, C₃-C₁₁ cycloalkyl, C₄-C₁₁ cycloalkylmethyl, C₆-C₁₀ aryl, C₇-C₁₁ arylalkyl, or C₁-C₁₀ alkyl substituted with
10 0-2 R⁴;

m is 0-2;

n is 0-4;

p is 0-2;

15 q is 0-1; and

r is 0-2;

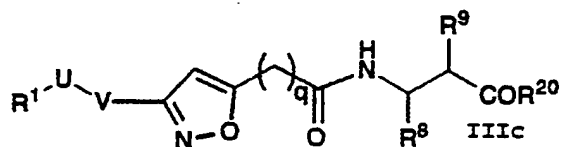
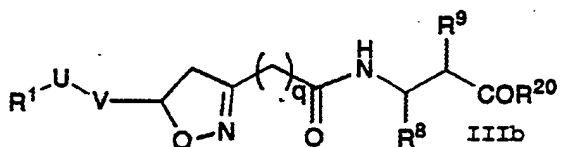
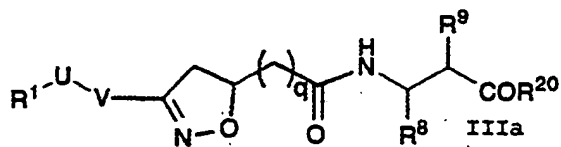
with the following provisos:

(1) when b is a double bond, Q and U are not
20 -(CH₂)-; and

(2) n, m and q are chosen such that the number of atoms connecting R¹ and Y is in the range of 8-14; and

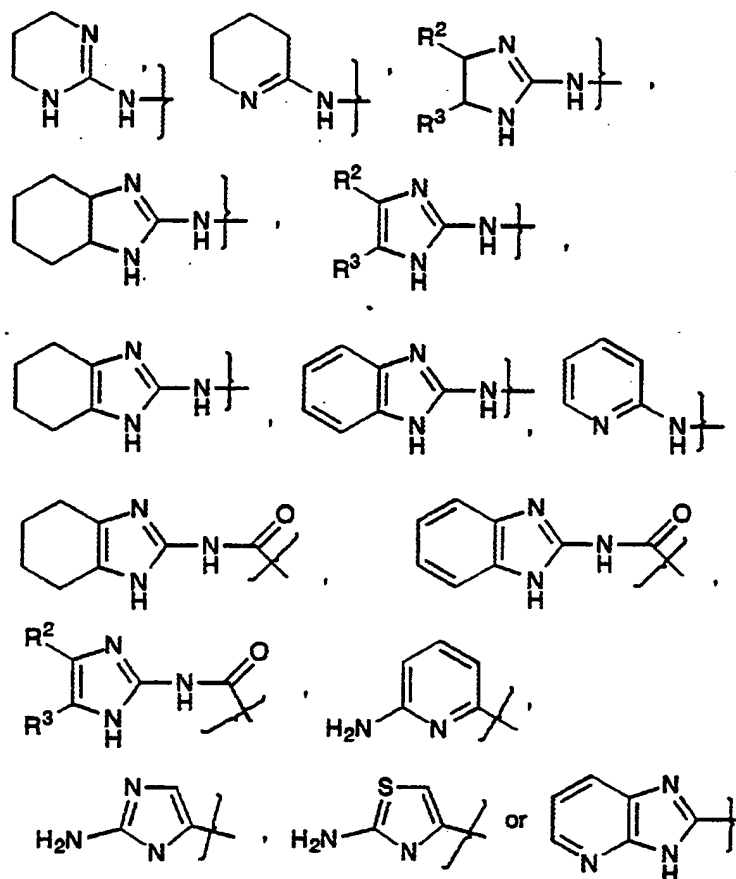
(3) when V is -(phenyl)-Q-, then either: U is not a
25 direct bond (i.e., U is not -(CH₂)_n- where n = 0) or Q is not a direct bond (i.e., Q is not -(CH₂)_n- where n = 0).

[4] Still further preferred are compounds of the above
30 invention of Formula IIIa, IIIb or IIIc:



including enantiomeric or diastereomeric forms thereof,
 or mixtures of enantiomeric or diastereomeric forms
 5 thereof, or pharmaceutically acceptable salt or prodrug
 forms thereof wherein:

R¹-U taken together are selected from:



5 R^2 and R^3 are independently selected from: H, C_1-C_4
 alkoxy, halogen, C_1-C_6 alkyl, or C_3-C_6 alkenyl;

10 V is selected from:
 - $(CH_2)_n$,
 - $(C_1-C_6 \text{ alkylene})-Q-$, substituted with 0-1 groups
 independently selected from R^{13} or,
 - $(C_2-C_7 \text{ alkenylene})-Q-$, substituted with 0-1 groups
 independently selected from R^{13} , or
 - (phenyl)- $Q-$, said phenyl substituted with 0-1
 groups independently selected from R^{13} ,

15

Q is selected from:

- (CH₂)_n -,
 -O-,
 -N(R¹²) -,
 -N(R¹⁰)C(=O) -, or
 5 -C(=O)N(R¹⁰) -;

R⁷ is selected from:

- H, hydroxy, C₁-C₄ alkoxy, C₁-C₄ alkylcarbonyl,
 -N(R¹⁰)(R¹¹), CO₂R^{18a}, SO₂N(R¹⁰)R¹¹, or OR¹⁰;

10

R⁸ is selected from:

- H, CONR¹⁷R^{18a}, C₁-C₁₀ alkyl, C₂-C₁₀ alkenyl,
 C₂-C₁₀ alkynyl, C₃-C₈ cycloalkyl, pyridinyl, or
 aryl, wherein said aryl or pyridinyl groups
 15 are optionally substituted with 0-3
 substituents selected from the group
 consisting of: C₁-C₄ alkyl, C₁-C₄ alkoxy,
 aryl, halo, cyano, CF₃, and NO₂.

- 20 R⁹ is selected from: H or -NHR¹⁶;

R¹⁰ is selected from H or C₁-C₁₀ alkyl;

- R¹¹ is selected from hydrogen, hydroxy, C₁ to C₈ alkyl,
 25 C₃-C₆ alkenyl, C₃ to C₁₁ cycloalkyl, C₄ to C₁₁
 cycloalkylmethyl, C₁-C₆ alkoxy, benzyloxy, C₆ to C₁₀
 aryl, heteroaryl, heteroarylalkyl, C₇ to C₁₁
 arylalkyl, or adamantylmethyl;

- 30 R¹³ is selected from: H, hydroxy, C₁-C₁₀ alkoxy,
 N(R¹⁰)R¹¹, -N(R¹⁶)R¹⁷, C₁-C₁₀ alkyl substituted with
 0-2 R⁷, aryl substituted with 0-3 R⁷, heteroaryl
 substituted with 0-2 R⁷, or C₁-C₆ alkylcarbonyl;

- 35 R¹⁶ is selected from:

-C(=O)-O-R^{18a},

-SO₂-R^{18a} or,
-SO₂-NHR^{18a};

5 R^{18a} is selected from: C₁-C₈ alkyl, C₃-C₁₁ cycloalkyl,
aryl(C₁-C₆ alkyl)-, (C₁-C₆ alkyl)aryl,
heteroaryl(C₁-C₆ alkyl)-, (C₁-C₆ alkyl)heteroaryl,
biaryl(C₁-C₆ alkyl), heteroaryl, or aryl, wherein
said aryl or heteroaryl groups are optionally
substituted with 0-2 R¹⁹;
10 R¹⁹ is selected from: H, Br, F, Cl, CF₃, CN, NO₂, NHR¹¹,
C₁-C₄ alkyl, aryl, aryl(C₁-C₄ alkyl)-, C₁-C₄ alkoxy,
C₁-C₄ alkoxy carbonyl, or -O-aryl, wherein said aryl
groups are optionally substituted with 0-3
15 substituents selected from a group consisting of
halogen, CF₃, C₁-C₃ alkyl, or C₁-C₃ alkoxy;

R²⁰ is selected from:
hydroxy;
20 C₁ to C₁₀ alkoxy;
methylcarbonyloxymethoxy-;
ethylcarbonyloxymethoxy-;
t-butylcarbonyloxymethoxy-;
cyclohexylcarbonyloxymethoxy-;
25 1-(methylcarbonyloxy)ethoxy-;
1-(ethylcarbonyloxy)ethoxy-;
1-(t-butylcarbonyloxy)ethoxy-;
1-(cyclohexylcarbonyloxy)ethoxy-;
i-propyloxycarbonyloxymethoxy-;
30 t-butyloxycarbonyloxymethoxy-;
1-(i-propyloxycarbonyloxy)ethoxy-;
1-(cyclohexyloxycarbonyloxy)ethoxy-;
1-(t-butyloxycarbonyloxy)ethoxy-;
dimethylaminoethoxy-;
35 diethylaminoethoxy-;

(5-methyl-1,3-dioxacyclopenten-2-on-4-yl)methoxy-;
(5-(t-butyl)-1,3-dioxacyclopenten-2-on-4-yl)methoxy-;

(1,3-dioxa-5-phenyl-cyclopenten-2-on-4-yl)methoxy-

5 or;

1-(2-(2-methoxypropyl)carbonyloxy)ethoxy-;

n is 0-4;

q is 0-1;

10

with the proviso that n, and q are chosen such that the number of atoms connecting R¹ and COR²⁰ is in the range of 8-14;

15

[5] Specifically preferred compounds of the above invention are compounds of Formula I, including enantiomeric or diasteriomeric forms thereof, or mixtures of enantiomeric or diasteriomeric forms thereof, or pharmaceutically acceptable salt or prodrug forms thereof selected from the group consisting of:

3-[3-[3-(imidazolin-2-ylamino)propyl]isoxazolin-5-ylmethylcarbonylamino]-2-(benzyloxycarbonylamino)-propionic acid,
25 3-[3-[3-(imidazolin-2-ylamino)propyl]isoxazolin-5-ylmethylcarbonylamino]-2-(n-butylloxycarbonyl-amino)propionic acid,
30 3-[3-[3-(imidazolin-2-ylamino)propyl]isoxazolin-5-ylmethylcarbonylamino]-2-(phenylsulfonylamino)propionic acid,
35 3-[3-[3-(imidazolin-2-ylamino)propyl]isoxazolin-5-

- ylmethylcarbonylamino]-2-(n-butylsulfonylamino)-propionic acid,
3-[3-[3-(tetrahydropyrimid-2-ylamino)propyl]-isoxazolin-5-ylmethylcarbonylamino]-2-
5 (benzyloxycarbonylamino)propionic acid,
3-[3-[3-(tetrahydropyrimid-2-ylamino)propyl]-isoxazolin-5-ylmethylcarbonyl amino]-2-(n-butylloxycarbonylamino)propionic acid,
3-[3-[3-(tetrahydropyrimid-2-ylamino)propyl]-isoxazolin-5-ylmethylcarbonylamino]-2-
10 (phenylsulfonylamino)propionic acid,
3-[3-[3-(tetrahydropyrimid-2-ylamino)propyl]-isoxazolin-5-ylmethylcarbonylamino]-2-(n-butylsulfonyl)aminopropionic acid,
15 3-[3-[4-(imidazolin-2-ylamino)butyl]isoxazolin-5-ylcarbonylamino]-2-(benzyloxycarbonylamino)-propionic acid,
3-[3-[4-(imidazolin-2-ylamino)butyl]isoxazolin-5-ylcarbonylamino]-2-(n-butylloxycarbonyl-amino)propionic acid,
20 3-[3-[4-(imidazolin-2-ylamino)butyl]isoxazolin-5-ylcarbonylamino]-2-(phenylsulfonylamino)-propionic acid,
25 3-[3-[4-(imidazolin-2-ylamino)butyl]isoxazolin-5-ylcarbonylamino]-2-(n-butylsulfonylamino)-propionic acid,
30 3-[3-[4-(tetrahydropyrimid-2-ylamino)butyl]-isoxazolin-5-ylcarbonylamino]-2-(benzyloxycarbonylamino)propionic acid,
3-[3-[4-(tetrahydropyrimid-2-ylamino)butyl]-isoxazolin-5-ylcarbonyl amino]-2-(n-butylloxycarbonylamino)propionic acid,
35

- 3-[3-[4-(tetrahydropyrimid-2-ylamino)butyl]-
isoxazolin-5-ylcarbonylamino]-2-
(phenylsulfonylamino)propionic acid,
- 5 3-[3-[4-(tetrahydropyrimid-2-ylamino)butyl]-
isoxazolin-5-ylcarbonylamino]-2-(n-
butylsulfonyl)aminopropionic acid,
- 10 3-[3-[3-(imidazolin-2-
ylamino)propyl]isoxazolin-5-
ylcarbonylamino]-2-
(benzyloxycarbonylamino)-propionic acid,
- 15 3-[3-[3-(imidazolin-2-
ylamino)propyl]isoxazolin-5-
ylcarbonylamino]-2-(phenylsulfonylamino)
propionic acid,
- 20 3-[3-[3-(tetrahydropyrimid-2-ylamino)propyl]-
isoxazolin-5-ylcarbonylamino]-2-
(benzyloxycarbonylamino)propionic acid,
- 25 3-[3-[3-(tetrahydropyrimid-2-ylamino)propyl]-
isoxazolin-5-ylcarbonylamino]-2-
(phenylsulfonylamino)propionic acid,
- 30 3-[3-[3-(2-aminothiazol-4-
yl)propyl]isoxazolin-5-ylcarbonylamino]-
2-(phenylsulfonylamino) propionic acid,
- 35 3-[3-[3-(2-aminothiazol-4-
yl)propyl]isoxazolin-5-ylcarbonylamino]-
2-(benzyloxycarbonylamino)propionic acid,
- 3-[3-[4-(imidazolin-2-
ylamino)butyl]isoxazolin-5-
ylcarbonylamino]-2-((2,4,6-
trimethylphenyl)sulfonylamino)propionic
acid,
- 3-[3-[4-(tetrahydropyrimid-2-ylamino)butyl]-
isoxazolin-5-ylcarbonylamino]-2-((2,4,6-
trimethylphenyl)sulfonylamino)propionic
acid,

- 3-[3-[4-(imidazol-2-ylamino)butyl]isoxazolin-5-ylcarbonylamino]-2-(benzyloxycarbonylamino)-propionic acid,
- 5 3-[3-[4-(imidazol-2-ylamino)butyl]isoxazolin-5-ylcarbonylamino]-2-(phenylsulfonylamino)-propionic acid,
- 10 3-[3-[4-(imidazol-2-ylamino)butyl]isoxazolin-5-ylcarbonylamino]-2-((2,6,dichlorophenyl)sulfonylamino)propionic acid,
- 15 3-[3-[4-(imidazol-2-ylamino)butyl]isoxazolin-5-ylcarbonylamino]-2-((4-biphenyl)sulfonylamino)propionic acid,
- 20 3-[3-[4-(imidazol-2-ylamino)butyl]isoxazolin-5-ylcarbonylamino]-2-(1-naphthylsulfonylamino)propionic acid,
- 25 3-[3-[3-(imidazol-2-ylamino)propyl]isoxazolin-5-ylmethylcarbonylamino]-2-benzyloxycarbonylamino)propionic acid,
- 30 3-[3-[3-(imidazol-2-ylamino)propyl]isoxazolin-5-ylmethylcarbonylamino]-2-(phenylsulfonylamino)propionic acid,
- 3-[3-[3-(imidazol-2-ylamino)propyl]isoxazolin-5-ylmethylcarbonylamino]-2-((2,6,dichlorophenyl)sulfonylamino)propionic acid,
- 3-[3-[3-(imidazol-2-ylamino)propyl]isoxazolin-5-ylmethylcarbonylamino]-2-((2,4,6,trimethylphenyl)sulfonylamino)-propionic acid,

- 3-[3-[3-(imidazol-2-ylamino)propyl]isoxazolin-5-ylmethylcarbonylamino]-2-((4-biphenyl)-sulfonylamino)propionic acid,
- 5 3-[3-[3-(imidazol-2-ylamino)propyl]isoxazolin-5-ylmethylcarbonylamino]-2-(1-naphthylsulfonylamino)propionic acid,
- 3-[3-[2-(imidazol-2-ylamino)ethyl]isoxazolin-5-ylcarbonylamino]-2-(benzyloxycarbonylamino)-propionic acid,
- 10 3-[3-[2-(imidazol-2-ylamino)ethyl]isoxazolin-5-ylcarbonylamino]-2-(phenylsulfonylamino)-propionic acid,
- 3-[3-[2-(imidazol-2-ylamino)ethyl]isoxazolin-5-ylcarbonylamino]-2-((2,6-dichlorophenyl)-sulfonylamino)propionic acid,
- 15 3-[3-[2-(imidazol-2-ylamino)ethyl]isoxazolin-5-ylcarbonylamino]-2-((2,4,6-trimethylphenyl)sulfonylamino)propionic acid,
- 20 3-[3-[2-(imidazol-2-ylamino)ethyl]isoxazolin-5-ylcarbonylamino]-2-((4-biphenyl)sulfonyl-amino)propionic acid,
- 3-[3-[2-(imidazol-2-ylamino)ethyl]isoxazolin-5-ylcarbonylamino]-2-(1-naphthylsulfonylamino)propionic acid,
- 25 3-[3-[3-(imidazol-2-ylaminocarbonyl)propyl]isoxazolin-5-ylcarbonylamino]-2-((2,4,6-trimethylphenyl)sulfonylamino)-propionic acid,
- 30 3-[3-[3-(2-aminoimidazol-4-yl)propyl]isoxazolin-5-ylcarbonylamino]-2-((2,4,6-trimethylphenyl)sulfonylamino)propionic acid,
- 35 3-[3-[2-(2-aminoimidazol-4-yl)ethyl]isoxazolin-5-

- ylmethylcarbonylamino]-2-
((2,4,6,trimethylphenyl)sulfonylamino)-
propionic acid,
- 5 3-[3-[4-(benzimidazol-2-ylamino)butyl]
isoxazolin-5-ylcarbonylamino]-2-
((2,4,6,trimethylphenyl)sulfonylamino)
propionic acid,
- 10 3-[3-[3-(benzimidazol-2-ylamino)propyl]
isoxazolin-5-ylmethylcarbonylamino]-2-
((2,4,6,trimethylphenyl)sulfonylamino)
propionic acid,
- 15 3-[3-[3-(benzimidazol-2-ylaminocarbonyl)propyl] isoxazolin-5-
ylcarbonylamino]-2-
((2,4,6,trimethylphenyl)sulfonylamino)-
propionic acid,
- 20 3-[3-[4-(4-methylimidazol-2-ylamino)butyl]-
isoxazolin-5-ylcarbonylamino]-2-
((2,4,6,trimethylphenyl)sulfonylamino)-
propionic acid,
- 25 3-[3-[3-(4-methylimidazol-2-ylamino)propyl]-
isoxazolin-5-ylmethylcarbonylamino]-2-
((2,4,6,trimethylphenyl)sulfonylamino)-
propionic acid,
- 30 3-[3-[4-(4,5-dimethylimidazol-2-ylamino)butyl]- isoxazolin-5-
ylcarbonylamino]-2-
((2,4,6,trimethylphenyl)sulfonylamino)-
propionic acid,
- 35 3-[3-[3-(4,5-dimethylimidazol-2-ylaminocarbonyl)propyl] isoxazolin-5-

- ylcarbonylamino] -2-
((2,4,6,trimethylphenyl)sulfonylamino) -
propionic acid,
3- [3- [4- (4,5,6,7-tetrahydrobenzimidazol-2-
5 ylamino)butyl]isoxazolin-5-
ylcarbonylamino] -2-
((2,4,6,trimethylphenyl)sulfonylamino) -
propionic acid,
3- [3- [3- (4,5,6,7-tetrahydrobenzimidazol-2-
10 ylamino)propyl]isoxazolin-
5-ylmethylcarbonylamino] -2-
((2,4,6,trimethylphenyl)sulfonyl-
amino)propionic acid,
3- [3- [4- (pyridin-2-ylamino)butyl]isoxazolin-5-
15 ylcabonylamino] -2-
((2,4,6,trimethylphenyl)
sulfonylamino)propionic acid,
3- [3- [3- (pyridin-2-ylamino)propyl]isoxazolin-
5-ylmethylcarbonylamino] -2-
20 ((2,4,6,trimethylphenyl)sulfonyl-
amino)propionic acid,
3- [3- [3- (2-pyridin-6-yl)propyl]isoxazolin-5-
ylcarbonylamino] -2-
((2,4,6,trimethylphenyl)
25 sulfonylamino)propionic acid,
3- [3- [2- (2-aminopyridin-6-yl)ethyl]isoxazolin-
5-ylmethylcarbonylamino] -2-
((2,4,6,trimethylphenyl)sulfonylamino) -
propionic acid,
30 3- [3- [3- (7-azabenzimidazol-2-yl)propyl]
isoxazolin-5-ylcarbonylamino] -2-
((2,4,6,trimethylphenyl)sulfonylamino) -
propionic acid,
3- [5- [3- (imidazolin-2-ylamino)propyl]
35 isoxazolin-3-ylmethylcarbonylamino] -2-
(benzyloxycarbonylamino) -propionic acid,

- 3-[5-[3-(imidazolin-2-ylamino)propyl]isoxazolin-3-ylmethylcarbonylamino]-2-(n-butyloxycarbonyl-amino)propionic acid,
- 5 3-[5-[3-(imidazolin-2-ylamino)propyl]isoxazolin-3-ylmethylcarbonylamino]-2-(phenylsulfonylamino)propionic acid,
- 10 3-[5-[3-(imidazolin-2-ylamino)propyl]isoxazolin-3-ylmethylcarbonylamino]-2-(2,4,6-trimethylphenylsulfonylamino)propionic acid,
- 15 3-[5-[3-(imidazolin-2-ylamino)propyl]isoxazolin-3-ylmethylcarbonylamino]-2-(n-butylsulfonylamino)-propionic acid,
- 20 3-[5-[3-(tetrahydropyrimid-2-ylamino)propyl]-isoxazolin-3-ylmethylcarbonylamino]-2-(benzyloxycarbonylamino)propionic acid,
- 3-[5-[3-(tetrahydropyrimid-2-ylamino)propyl]-isoxazolin-3-ylmethylcarbonyl amino]-2-(n-butyloxycarbonylamino)propionic acid,
- 25 3-[5-[3-(tetrahydropyrimid-2-ylamino)propyl]-isoxazolin-3-ylmethylcarbonylamino]-2-(phenylsulfonylamino)propionic acid,
- 3-[5-[3-(tetrahydropyrimid-2-ylamino)propyl]-isoxazolin-3-ylmethylcarbonylamino]-2-(2,4,6-trimethylphenylsulfonylamino)propionic acid,
- 30 3-[5-[3-(tetrahydropyrimid-2-ylamino)propyl]-isoxazolin-3-ylmethylcarbonylamino]-2-(n-butylsulfonyl)aminopropionic acid,
- 35 3-[5-[4-(imidazolin-2-ylamino)butyl]isoxazolin-3-

- ylcarbonylamino]-2-
(benzyloxycarbonylamino)- propionic acid,
3-[5-[4-(imidazolin-2-
ylamino)butyl]isoxazolin-3-
5 ylcarbonylamino]-2-(n-butyloxycarbonyl-
amino)propionic acid,
3-[5-[4-(imidazolin-2-
ylamino)butyl]isoxazolin-3-
ylcarbonylamino]-2-
10 (phenylsulfonylamino)propionic acid,
3-[5-[4-(imidazolin-2-
ylamino)butyl]isoxazolin-3-
ylcarbonylamino]-2-(n-butyloxycarbonylamino)
propionic acid,
15 3-[5-[4-(tetrahydropyrimid-2-ylamino)butyl]-
isoxazolin-3-ylcarbonylamino]-2-
(benzyloxycarbonylamino)propionic acid,
3-[5-[4-(tetrahydropyrimid-2-ylamino)butyl]-
isoxazolin-3-ylcarbonyl amino]-2-(n-
20 butyloxycarbonylamino)propionic acid,
3-[5-[4-(tetrahydropyrimid-2-ylamino)butyl]-
isoxazolin-3-ylcarbonylamino]-2-
(phenylsulfonylamino)propionic acid,
3-[5-[4-(tetrahydropyrimid-2-ylamino)butyl]-
25 isoxazolin-3-ylcarbonylamino]-2-(n-
butylsulfonyl)aminopropionic acid,
3-[5-[3-(imidazol-2-yl
amino)propyl]isoxazolin-3-
ylcarbonylamino]-2-
30 (benzyloxycarbonylamino)-propionic acid,
3-[5-[3-(imidazolin-2-
ylamino)propyl]isoxazolin-3-
ylcarbonylamino]-2-(n-propyloxycarbonyl-
amino)propionic acid,
35 3-[5-[3-(imidazolin-2-
ylamino)propyl]isoxazolin-3-

- ylcarbonylamino]-2-
(phenylsulfonylamino)propionic acid,
3-[5-[3-(imidazolin-2-
ylamino)propyl]isoxazolin-3-
5 ylcarbonylamino]-2-(n-
propylsulfonylamino)propionic acid,
3-[5-[3-(tetrahydropyrimid-2-ylamino)propyl]-
isoxazolin-3-ylcarbonylamino]-2-
(benzyloxycarbonylamino)propionic acid,
10 3-[5-[3-(tetrahydropyrimid-2-ylamino)propyl]-
isoxazolin-3-ylmethylcarbonyl amino]-2-
(n-propyloxycarbonylamino)propionic acid,
3-[5-[3-(tetrahydropyrimid-2-ylamino)propyl]-
isoxazolin-3-ylcarbonylamino]-2-
15 (phenylsulfonylamino)propionic acid,
3-[5-[3-(tetrahydropyrimid-2-ylamino)propyl]-
isoxazolin-3-ylcarbonylamino]-2-(n-
propylsulfonyl)aminopropionic acid,
3-[5-[2-(imidazolin-2-
20 ylamino)ethyl]isoxazolin-3-
ylcarbonylamino]-2-(phenylsulfonylamino)-
propionic acid,
3-[5-[4-(pyridin-2-ylamino)butyl]isoxazolin-3-
ylcarbonylamino]-2-(phenylsulfonylamino)-
25 propionic acid,
3-[5-[4-(pyridin-2-ylamino)butyl]isoxazolin-3-
ylcarbonylamino]-2-(2,6-dichlorophenyl-
sulfonylamino)propionic acid,
3-[5-[4-(pyridin-2-ylamino)butyl]isoxazolin-3-
30 ylcarbonylamino]-2-(2,4,6-
trimethylphenyl- sulfonylamino)propionic
acid,
3-[5-[4-(pyridin-2-ylamino)butyl]isoxazolin-3-
ylcarbonylamino]-2-(4-
35 biphenylsulfonylamino)propionic acid,

- 3-[5-[4-(pyridin-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino]-2-(1-naphthylsulfonylamino)propionic acid,
- 5 3-[5-[3-(2-aminopyridin-6-yl)propyl]isoxazolin-3-ylcarbonylamino]-2-(2,4,6-trimethylphenylsulfonylamino)propionic acid,
- 10 3-[5-[4-(imidazol-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino]-2-(phenylsulfonylamino)-propionic acid,
- 3-[5-[4-(imidazol-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino]-2-(2,6-dichlorophenylsulfonylamino)propionic acid,
- 15 3-[5-[4-(imidazol-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino]-2-(2,4,6-trimethylphenylsulfonylamino)propionic acid,
- 3-[5-[4-(imidazol-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino]-2-(4-biphenylsulfonylamino)propionic acid,
- 20 3-[5-[4-(imidazol-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino]-2-(1-naphthylsulfonylamino)propionic acid,
- 3-[5-[3-(2-aminoimidazol-4-yl)propyl]isoxazolin-3-ylcarbonylamino]-2-(phenylsulfonylamino)-propionic acid,
- 25 3-[5-[3-(2-aminoimidazol-4-yl)propyl]isoxazolin-3-ylcarbonylamino]-2-(2,6-dichlorophenylsulfonylamino)propionic acid,
- 30 3-[5-[3-(2-aminoimidazol-4-yl)propyl]isoxazolin-3-ylcarbonylamino]-2-(2,4,6-trimethylphenylsulfonylamino)propionic acid,
- 35 3-[5-[3-(2-aminoimidazol-4-yl)propyl]isoxazolin-3-ylcarbonylamino]-

- 2-(4-biphenylsulfonylamino)propionic acid,
- 3-[5-[3-(2-aminoimidazol-4-yl)propyl]isoxazolin-3-ylcarbonylamino]-2-(1-naphthylsulfonylamino)propionic acid,
- 3-[5-[2-(imidazol-2-ylamino)ethyl]isoxazolin-3-ylcarbonylamino]-2-(phenylsulfonylamino)-propionic acid,
- 3-[5-[2-(imidazol-2-ylamino)ethyl]isoxazolin-3-ylcarbonylamino]-2-(2,6-dichlorophenylsulfonylamino)propionic acid,
- 3-[5-[2-(imidazol-2-ylamino)ethyl]isoxazolin-3-ylcarbonylamino]-2-(2,4,6-trimethylphenylsulfonylamino)propionic acid,
- 3-[5-[2-(imidazol-2-ylamino)ethyl]isoxazolin-3-ylcarbonylamino]-2-(4-biphenylsulfonylamino)propionic acid,
- 3-[5-[2-(imidazol-2-ylamino)ethyl]isoxazolin-3-ylcarbonylamino]-2-(1-naphthylsulfonylamino)propionic acid,
- 3-[5-[3-(imidazol-2-ylaminocarbonyl)propyl]isoxazolin-3-ylcarbonylamino]-2-(2,4,6-trimethylphenylsulfonylamino)propionic acid,
- 3-[5-[3-(benzimidazol-2-ylaminocarbonyl)propyl]isoxazolin-3-ylcarbonylamino]-2-(2,4,6-trimethylphenylsulfonylamino)propionic acid,
- 3-[5-[4-(benzimidazol-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino]-2-(phenylsulfonylamino)propionic acid,
- 3-[5-[4-(benzimidazol-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino]-2-(2,6-

- dichlorophenylsulfonylamino) propionic acid,
- 3- [5- [4- (benzimidazol-2-ylamino) butyl] isoxazolin-3-ylcarbonylamino] -2- (2,4,6-trimethylphenylsulfonylamino) propionic acid,
- 3- [5- [4- (benzimidazol-2-ylamino) butyl] isoxazolin-3-ylcarbonylamino] -2- (4-biphenylsulfonylamino) propionic acid,
- 3- [5- [4- (benzimidazol-2-ylamino) butyl] isoxazolin-3-ylcarbonylamino] -2- (1-naphthylsulfonylamino) propionic acid,
- 3- [5- [4- (4-methylimidazol-2-ylamino) butyl] - isoxazolin-3-ylcarbonylamino] -2- (phenylsulfonylamino) propionic acid,
- 3- [5- [4- (4-methylimidazol-2-ylamino) butyl] - isoxazolin-3-ylcarbonylamino] -2- (2,6-dichlorophenylsulfonylamino) propionic acid,
- 3- [5- [4- (4-methylimidazol-2-ylamino) butyl] - isoxazolin-3-ylcarbonylamino] -2- (2,4,6-trimethylphenylsulfonylamino) propionic acid,
- 3- [5- [4- (4-methylimidazol-2-ylamino) butyl] - isoxazolin-3-ylcarbonylamino] -2- (4-biphenylsulfonylamino) propionic acid,
- 3- [5- [4- (4-methylimidazol-2-ylamino) butyl] - isoxazolin-3-ylcarbonylamino] -2- (1-naphthylsulfonylamino) propionic acid,
- 3- [5- [4- (4,5-dimethylimidazol-2-ylamino) butyl] - isoxazolin-3-ylcarbonylamino] -2- (phenylsulfonylamino) propionic acid,
- 3- [5- [4- (4,5-dimethylimidazol-2-ylamino) butyl] - isoxazolin-3-ylcarbonylamino] -2- (2,6-

- dichlorophenylsulfonylamino)propionic acid,
- 3-[5-[4-(4,5-dimethylimidazol-2-ylamino)butyl]-isoxazolin-3-ylcarbonylamino]-2-(2,4,6-trimethylphenylsulfonylamino)propionic acid,
- 3-[5-[4-(4,5-dimethylimidazol-2-ylamino)butyl]-isoxazolin-3-ylcarbonylamino]-2-(4-biphenylsulfonylamino)propionic acid,
- 3-[5-[4-(4,5-dimethylimidazol-2-ylamino)butyl]-isoxazolin-3-ylcarbonylamino]-2-(1-naphthylsulfonylamino)propionic acid,
- 3-[5-[4-(4,5,6,7-tetrahydrobenzimidazol-2-ylamino)butyl]-isoxazolin-3-ylcarbonylamino]-2-(phenylsulfonylamino)propionic acid,
- 3-[5-[4-(4,5,6,7-tetrahydrobenzimidazol-2-ylamino)butyl]-isoxazolin-3-ylcarbonylamino]-2-(2,6-dichlorophenylsulfonylamino)propionic acid,
- 3-[5-[4-(4,5,6,7-tetrahydrobenzimidazol-2-ylamino)butyl]-isoxazolin-3-ylcarbonylamino]-2-(2,4,6-trimethylphenylsulfonylamino)propionic acid,
- 3-[5-[4-(4,5,6,7-tetrahydrobenzimidazol-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino]-2-(4-biphenylsulfonylamino)propionic acid,
- 3-[5-[4-(4,5,6,7-tetrahydrobenzimidazol-2-ylamino)butyl]-isoxazolin-3-ylcarbonylamino]-2-(1-naphthylsulfonylamino)propionic acid,

- 3-[5-[3-(7-azabenzimidazol-2-yl)propyl]
isoxazolin-3-ylcarbonylamino]-2-(2,4,6-
trimethylphenylsulfonylamino) propionic
acid,
- 5 3-[5-[4-(imidazol-2-ylamino)butyl]isoxazolin-
3-ylcarbonylamino]-2-[(2,6-dimethyl-4-
phenyl)phenylsulfonylamino]propionic
acid,
- 10 3-[5-[4-(4-methylimidazol-2-
ylamino)butyl]isoxazolin-3-
ylcarbonylamino]-2-[(2,6-dimethyl-4-
phenyl)phenylsulfonylamino]propionic
acid,
- 15 3-[5-[4-(4,5-dimethylimidazol-2-
ylamino)butyl]isoxazolin-3-
ylcarbonylamino]-2-[(2,6-dimethyl-4-
phenyl)phenylsulfonylamino]propionic
acid,
- 20 3-[5-[4-(4,5,6,7-tetrahydrobenzimidazol-2-
ylamino)butyl]isoxazolin-3-
ylcarbonylamino]-2-[(2,6-dimethyl-4-
phenyl)phenylsulfonylamino]propionic
acid,
- 25 3-[5-[4-(imidazol-2-ylamino)butyl]isoxazolin-
3-ylcarbonylamino]-2-[(2,6-dichloro-4-
phenyl)phenylsulfonylamino]propionic
acid,
- 30 3-[5-[4-(4-methylimidazol-2-
ylamino)butyl]isoxazolin-3-
ylcarbonylamino]-2-[(2,6-dichloro-4-
phenyl)phenylsulfonylamino]propionic
acid,
- 35 3-[5-[4-(4,5-dimethylimidazol-2-
ylamino)butyl]isoxazolin-3-
ylcarbonylamino]-2-[(2,6-dichloro-4-

- phenyl)phenylsulfonylamino]propionic acid,
- 3-[5-[4-(4,5,6,7-tetrahydrobenzimidazol-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino]-2-[(2,6-dichloro-4-phenyl)phenylsulfonylamino]propionic acid,
- 3-[5-[4-(imidazol-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino]-3-(phenylsulfonylmethyl) propionic acid,
- 3-[5-[4-(imidazol-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino]-3-(1-adamantylmethylaminocarbonyl)propionic acid,
- 3-[5-[4-(imidazol-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino]-3-(3-pyridinyl)propionic acid,
- 3-[3-[3-(imidazolin-2-yl amino)propyloxy]isoxazol-5-ylcarbonylamino]-2-(benzyloxycarbonylamino)-propionic acid,
- 3-[3-[3-(imidazolin-2-ylamino)propyloxy]isoxazol-5-yl carbonyl amino]-2-(n-butyloxycarbonyl-amino)propionic acid,
- 3-[3-[3-(imidazolin-2-ylamino)propyloxy]isoxazol-5-yl carbonylamino]-2-(phenylsulfonylamino)propionic acid,
- 3-[3-[3-(imidazolin-2-ylamino)propyloxy]isoxazol-5-yl carbonyl amino]-2-(n-butyloxycarbonylamino)-propionic acid,
- 3-[3-[3-(tetrahydropyrimid-2-ylamino)propyloxy]-isoxazol-5-ylcarbonylamino]-2-(benzyloxycarbonylamino)propionic acid,
- 3-[3-[3-(tetrahydropyrimid-2-ylamino)propyloxy]-isoxazol-5-ylcarbonyl amino]-2-(n-butyloxycarbonylamino)propionic acid,

- 3- [3- [3- (tetrahydropyrimid-2-ylamino)propyloxy] -isoxazol-5-ylcarbonylamino] -2- (phenylsulfonylamino)propionic acid,
- 5 3- [3- [3- (tetrahydropyrimid-2-ylamino)propyloxy] -isoxazol-5-ylcarbonylamino] -2- (n-butylsulfonyl)aminopropionic acid,
- 10 3- [3- [2- (imidazolin-2-yl amino)ethyloxy] isoxazol-5-yl carbonylamino] -2- (benzyloxycarbonylamino) -propionic acid,
- 15 3- [3- [3- (imidazolin-2-ylamino)ethyloxy] isoxazol-5-yl carbonylamino] -2- (n-butylloxycarbonyl-amino)propionic acid,
- 20 3- [3- [3- (imidazolin-2-ylamino)ethyloxy] isoxazol-5-ylcarbonylamino] -2- (n-butylsulfonylamino)propionic acid,
- 25 3- [3- [3- (tetrahydropyrimid-2-yl amino)ethyloxy] -isoxazol-5-ylcarbonylamino] -2- (benzyloxycarbonylamino)propionic acid,
- 30 3- [3- [3- (tetrahydropyrimid-2-ylamino)ethyloxy] -isoxazol-5-ylcarbonylamino] -2- (n-butylloxycarbonylamino)propionic acid,
- 35 3- [3- [3- (tetrahydropyrimid-2-ylamino)ethyloxy] -isoxazol-5-ylcarbonylamino] -2- (phenylsulfonylamino)propionic acid,

- 3- [3- [3- (tetrahydropyrimid-2-ylamino) ethyloxy] -isoxazol-5-ylcarbonylamino] -2- (n-butylsulfonylamino) propionic acid,
- 5 3- [3- [3- (imidazol-2-ylamino) propyloxy] -isoxazol-5-ylcarbonylamino] -2- (phenylsulfonylamino) propionic acid,
- 3- [3- [3- (benzimidazol-2-ylamino) propyloxy] -isoxazol-5-ylcarbonylamino] -2- (phenylsulfonylamino) propionic acid,
- 10 3- [3- [3- (4-methylimidazol-2-ylamino) propyloxy] -isoxazol-5-ylcarbonylamino] -2- (phenylsulfonylamino) propionic acid,
- 15 3- [3- [3- (4,5-dimethylimidazol-2-ylamino) propyloxy] -isoxazol-5-ylcarbonylamino] -2- (phenylsulfonylamino) propionic acid,
- 20 3- [3- [3- (4,5,6,7-tetrahydrobenzimidazol-2-ylamino) propyloxy] -isoxazol-5-ylcarbonylamino] -2- (phenylsulfonylamino) propionic acid,
- 3- [3- [3- (pyridin-2-ylamino) propyloxy] -isoxazol-5-ylcarbonylamino] -2- (phenylsulfonylamino) propionic acid,
- 25 3- [3- [3- (imidazol-2-ylaminocarbonyl) ethoxy] -isoxazol-5-ylcarbonylamino] -2- (phenylsulfonylamino) propionic acid,

30

In the present invention it has been discovered that the compounds of Formula I above are useful as inhibitors of cell-matrix and cell-cell adhesion processes. The present invention includes novel

35 compounds of Formula I and methods for using such compounds for the prevention or treatment of diseases

resulting from abnormal cell adhesion to the extracellular matrix which comprises administering to a host in need of such treatment a therapeutically effective amount of such compound of Formula I.

5 In the present invention it has also been discovered that the compounds of Formula I above are useful as inhibitors of $\alpha_v\beta_3$. The compounds of the present invention inhibit the binding of vitronectin to $\alpha_v\beta_3$ and inhibit cell adhesion.

10

The present invention also provides pharmaceutical compositions comprising a compound of Formula I and a pharmaceutically acceptable carrier.

15 The compounds of Formula I of the present invention are useful for the treatment (including prevention) of angiogenic disorders. The term "angiogenic disorders" as used herein includes conditions involving abnormal neovascularization, such as tumor metastasis and ocular
20 neovascularization, including, for example, diabetic retinopathy, neovascular glaucoma, age-related macular degeneration, and retinal vein occlusion, comprising administering to a mammal in need of such treatment a therapeutically effective amount of a compound of
25 Formula I described above.

The compounds of Formula I of the present invention may be useful for the treatment or prevention of other diseases which involve cell adhesion processes,
30 including, but not limited to, inflammation, bone degradation, thromboembolic disorders, restenosis, rheumatoid arthritis, asthma, allergies, adult respiratory distress syndrome, graft versus host disease, organ transplantation rejection, septic shock,
35 psoriasis, eczema, contact dermatitis, osteoporosis, osteoarthritis, atherosclerosis, inflammatory bowel

disease and other autoimmune diseases. The compounds of Formula I of the present invention may also be useful for wound healing.

5 The term "thromboembolic disorders" as used herein includes conditions involving platelet activation and aggregation, such as arterial or venous cardiovascular or cerebrovascular thromboembolic disorders, including, for example, thrombosis, unstable angina, first or
10 recurrent myocardial infarction, ischemic sudden death, transient ischemic attack, stroke, atherosclerosis, venous thrombosis, deep vein thrombosis, thrombophlebitis, arterial embolism, coronary and cerebral arterial thrombosis, myocardial infarction,
15 cerebral embolism, kidney embolisms, pulmonary embolisms, or such disorders associated with diabetes, comprising administering to a mammal in need of such treatment a therapeutically effective amount of a compound of Formula I described above.

20

The compounds of the present invention may be used for other ex vivo applications to prevent cellular adhesion in biological samples.

The compounds of the present invention can also be
25 administered in combination with one or more additional therapeutic agents selected from: anti-coagulant or coagulation inhibitory agents, such as heparin or warfarin; anti-platelet or platelet inhibitory agents, such as aspirin, piroxicam, or ticlopidine; thrombin
30 inhibitors such as boro-peptides, hirudin or argatroban; or thrombolytic or fibrinolytic agents, such as plasminogen activators, anistreplase, urokinase, or streptokinase.

The compounds of Formula I of the present
35 invention can be administered in combination with one or more of the foregoing additional therapeutic agents,

thereby to reduce the doses of each drug required to achieve the desired therapeutic effect. Thus, the combination treatment of the present invention permits the use of lower doses of each component, with reduced adverse, toxic effects of each component. A lower dosage minimizes the potential of side effects of the compounds, thereby providing an increased margin of safety relative to the margin of safety for each component when used as a single agent. Such combination therapies may be employed to achieve synergistic or additive therapeutic effects for the treatment of thromboembolic disorders.

By "therapeutically effective amount" it is meant an amount of a compound of Formula I that when administered alone or in combination with an additional therapeutic agent to a cell or mammal is effective to prevent or ameliorate the thromboembolic disease condition or the progression of the disease.

By "administered in combination" or "combination therapy" it is meant that the compound of Formula I and one or more additional therapeutic agents are administered concurrently to the mammal being treated. When administered in combination each component may be administered at the same time or sequentially in any order at different points in time. Thus, each component may be administered separately but sufficiently closely in time so as to provide the desired therapeutic effect.

The term anti-coagulant agents (or coagulation inhibitory agents), as used herein, denotes agents that inhibit blood coagulation. Such agents include warfarin (available as COUMADINTM) and heparin.

The term anti-platelet agents (or platelet inhibitory agents), as used herein, denotes agents that inhibit platelet function such as by inhibiting the

aggregation, adhesion or granular secretion of platelets. Such agents include the various known non-steroidal anti-inflammatory drugs (NSAIDS) such as aspirin, ibuprofen, naproxen, sulindac, indomethacin, mefenamate, droxicam, diclofenac, sulfinpyrazone, and piroxicam, including pharmaceutically acceptable salts or prodrugs thereof. Of the NSAIDS, aspirin (acetylsalicyclic acid or ASA), and piroxicam. Piroxicam is commercially available from Pfizer Inc. (New York, NY), as FELDANETM. Other suitable anti-platelet agents include ticlopidine, including pharmaceutically acceptable salts or prodrugs thereof. Ticlopidine is also a preferred compound since it is known to be gentle on the gastro-intestinal tract in use. Still other suitable platelet inhibitory agents include thromboxane-A₂-receptor antagonists and thromboxane-A₂-synthetase inhibitors, as well as pharmaceutically acceptable salts or prodrugs thereof.

The phrase thrombin inhibitors (or anti-thrombin agents), as used herein, denotes inhibitors of the serine protease thrombin. By inhibiting thrombin, various thrombin-mediated processes, such as thrombin-mediated platelet activation (that is, for example, the aggregation of platelets, and/or the granular secretion of plasminogen activator inhibitor-1 and/or serotonin) and/or fibrin formation are disrupted. Such inhibitors include boroarginine derivatives and boroptides, hirudin and argatroban, including pharmaceutically acceptable salts and prodrugs thereof. Boroarginine derivatives and boroptides include N-acetyl and peptide derivatives of boronic acid, such as C-terminal α -aminoboronic acid derivatives of lysine, ornithine, arginine, homoarginine and corresponding isothiuronium analogs thereof. The term hirudin, as used herein, includes suitable derivatives or analogs of hirudin, referred to herein as hirulogs, such as

disulfatohirudin. Boro-peptide thrombin inhibitors include compounds described in Kettner et al., U.S. Patent No. 5,187,157 and European Patent Application Publication Number 293 881 A2, the disclosures of which
5 are hereby incorporated herein by reference. Other suitable boroarginine derivatives and boro-peptide thrombin inhibitors include those disclosed in PCT Application Publication Number 92/07869 and European Patent Application Publication Number 471 651 A2, the
10 disclosures of which are hereby incorporated herein by reference, in their entirety.

The phrase thrombolytics (or fibrinolytic) agents (or thrombolytics or fibrinolytics), as used herein, denotes agents that lyse blood clots (thrombi). Such
15 agents include tissue plasminogen activator, anistreplase, urokinase or streptokinase, including pharmaceutically acceptable salts or prodrugs thereof. Tissue plasminogen activator (tPA) is commercially available from Genentech Inc., South San Francisco,
20 California. The term anistreplase, as used herein, refers to anisoylated plasminogen streptokinase activator complex, as described, for example, in European Patent Application No. 028,489, the disclosures of which are hereby incorporated herein by reference
25 herein, in their entirety. Anistreplase is commercially available as EMINASE™. The term urokinase, as used herein, is intended to denote both dual and single chain urokinase, the latter also being referred to herein as prourokinase.

30 Administration of the compounds of Formula I of the invention in combination with such additional therapeutic agent, may afford an efficacy advantage over the compounds and agents alone, and may do so while permitting the use of lower doses of each. A lower
35 dosage minimizes the potential of side effects, thereby providing an increased margin of safety.

The compounds of the present invention are also useful as standard or reference compounds, for example as a quality standard or control, in tests or assays involving the binding of vitronectin or fibrinogen to $\alpha_v\beta_3$. Such compounds may be provided in a commercial kit, for example, for use in pharmaceutical research involving $\alpha_v\beta_3$. The compounds of the present invention may also be used in diagnostic assays involving $\alpha_v\beta_3$.

The compounds herein described may have asymmetric centers. Unless otherwise indicated, all chiral, diastereomeric and racemic forms are included in the present invention. Many geometric isomers of olefins, C=N double bonds, and the like can also be present in the compounds described herein, and all such stable isomers are contemplated in the present invention. It will be appreciated that compounds of the present invention that contain asymmetrically substituted carbon atoms may be isolated in optically active or racemic forms. It is well known in the art how to prepare optically active forms, such as by resolution of racemic forms or by synthesis, from optically active starting materials. All chiral, diastereomeric, racemic forms and all geometric isomeric forms of a structure are intended, unless the specific stereochemistry or isomer form is specifically indicated.

When any variable (for example but not limited to, R^2 , R^4 , R^6 , R^7 , R^8 , R^{12} , and R^{14} , n, etc.) occurs more than one time in any constituent or in any formula, its definition on each occurrence is independent of its definition at every other occurrence. Thus, for example, if a group is shown to be substituted with 0-2 R^4 , then said group may optionally be substituted with up to two R^4 and R^4 at each occurrence is selected independently from the defined list of possible R^4 .

Also, by way of example, for the group $-N(R^{5a})_2$, each of the two R^{5a} substituents on N is independently selected from the defined list of possible R^{5a} . Similarly, by way of example, for the group $-C(R^7)_2-$, each of the two
5 R^7 substituents on C is independently selected from the defined list of possible R^7 .

When a bond to a substituent is shown to cross the bond connecting two atoms in a ring, then such substituent may be bonded to any atom on the ring. When
10 a bond joining a substituent to another group is not specifically shown or the atom in such other group to which the bond joins is not specifically shown, then such substituent may form a bond with any atom on such other group.

15 When a substituent is listed without indicating the atom via which such substituent is bonded to the rest of the compound of Formula I, then such substituent may be bonded via any atom in such substituent. For example, when the substituent is piperazinyl, piperidinyl, or
20 tetrazolyl, unless specified otherwise, said piperazinyl, piperidinyl, tetrazolyl group may be bonded to the rest of the compound of Formula I via any atom in such piperazinyl, piperidinyl, tetrazolyl group.

Combinations of substituents and/or variables
25 are permissible only if such combinations result in stable compounds. By stable compound or stable structure it is meant herein a compound that is sufficiently robust to survive isolation to a useful degree of purity from a reaction mixture, and
30 formulation into an efficacious therapeutic agent.

The term "substituted", as used herein, means that any one or more hydrogen on the designated atom is replaced with a selection from the indicated group, provided that the designated atom's normal valency is
35 not exceeded, and that the substitution results in a

stable compound. When a substituent is keto (i.e., =O), then 2 hydrogens on the atom are replaced.

As used herein, "alkyl" is intended to include
5 both branched and straight-chain saturated aliphatic hydrocarbon groups having the specified number of carbon atoms (for example, "C₁-C₁₀" denotes alkyl having 1 to 10 carbon atoms); "haloalkyl" is intended to include both
10 branched and straight-chain saturated aliphatic hydrocarbon groups having the specified number of carbon atoms, substituted with 1 or more halogen (for example -C_vF_w where v = 1 to 3 and w = 1 to (2v+1)); "alkoxy" represents an alkyl group of indicated number of carbon atoms attached through an oxygen bridge; "cycloalkyl" is
15 intended to include saturated ring groups, including mono-, bi- or poly-cyclic ring systems, such as cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cycloheptyl, cyclooctyl, and adamantyl; and "biycloalkyl" is intended to include saturated bicyclic
20 ring groups such as [3.3.0]bicyclooctane, [4.3.0]bicyclononane, [4.4.0]bicyclodecane (decalin), [2.2.2]bicyclooctane, and so forth. "Alkenyl" is intended to include hydrocarbon chains of either a straight or branched configuration and one or more
25 unsaturated carbon-carbon bonds which may occur in any stable point along the chain, such as ethenyl, propenyl and the like; and "alkynyl" is intended to include hydrocarbon chains of either a straight or branched configuration and one or more triple carbon-carbon bonds
30 which may occur in any stable point along the chain, such as ethynyl, propynyl and the like.

The terms "alkylene", "alkenylene", "phenylene", and the like, refer to alkyl, alkenyl, and phenyl groups, respectively, which are connected by two bonds
35 to the rest of the structure of Formula I. Such "alkylene", "alkenylene", "phenylene", and the like, may

alternatively and equivalently be denoted herein as
"-(alkyl)-", "-(alkylenyl)-" and "-(phenyl)-", and the
like.

"Halo" or "halogen" as used herein refers to
5 fluoro, chloro, bromo and iodo; and "counterion" is used
to represent a small, negatively charged species such as
chloride, bromide, hydroxide, acetate, sulfate and the
like.

As used herein, "aryl" or "aromatic residue" is
10 intended to mean phenyl or naphthyl; the term
"arylalkyl" represents an aryl group attached through an
alkyl bridge.

As used herein, "carbocycle" or "carbocyclic
15 residue" is intended to mean any stable 3- to 7-
membered monocyclic or bicyclic or 7- to 14-membered
bicyclic or tricyclic or an up to 26-membered polycyclic
carbon ring, any of which may be saturated, partially
unsaturated, or aromatic. Examples of such carbocycles
20 include, but are not limited to, cyclopropyl,
cyclopentyl, cyclohexyl, phenyl, biphenyl, naphthyl,
indanyl, adamantyl, or tetrahydronaphthyl (tetralin).

As used herein, the term "heterocycle" or
25 "heterocyclic" is intended to mean a stable 5- to 7-
membered monocyclic or bicyclic or 7- to 10-membered
bicyclic heterocyclic ring which may be saturated,
partially unsaturated, or aromatic, and which consists
of carbon atoms and from 1 to 4 heteroatoms
30 independently selected from the group consisting of N, O
and S and wherein the nitrogen and sulfur heteroatoms
may optionally be oxidized, and the nitrogen may
optionally be quaternized, and including any bicyclic
group in which any of the above-defined heterocyclic
35 rings is fused to a benzene ring. The heterocyclic ring
may be attached to its pendant group at any heteroatom

or carbon atom which results in a stable structure. The heterocyclic rings described herein may be substituted on carbon or on a nitrogen atom if the resulting compound is stable. Examples of such heterocycles include, but are not limited to, pyridyl (pyridinyl), pyrimidinyl, furanyl (furyl), thiazolyl, thienyl, pyrrolyl, pyrazolyl, imidazolyl, tetrazolyl, benzofuranyl, benzothiophenyl, indolyl, indolenyl, isoxazolyl, isoxazolyl, quinolyl, isoquinolyl, benzimidazolyl, piperidinyl, 4-piperidonyl, pyrrolidinyl, 2-pyrrolidonyl, pyrrolinyl, tetrahydrofuranyl, tetrahydroquinolyl, tetrahydroisoquinolyl, decahydroquinolyl or octahydroisoquinolyl, azocinyl, triazinyl, 6H-1,2,5-thiadiazinyl, 2H,6H-1,5,2-dithiazinyl, thianthrenyl, pyranyl, isobenzofuranyl, chromenyl, xanthenyl, phenoxathiinyl, 2H-pyrrolyl, pyrrolyl, imidazolyl, pyrazolyl, isothiazolyl, isoxazolyl, isoxazolyl, oxazolyl, pyridinyl, pyrazinyl, pyrimidinyl, pyridazinyl, indolizynyl, isoindolyl, 3H-indolyl, indolyl, 1H-indazolyl, purinyl, 4H-quinolizynyl, isoquinolyl, quinolyl, phthalazinyl, naphthyridinyl, quinoxalinyl, quinazolyl, cinnolyl, pteridinyl, 4aH-carbazole, carbazole, 8-carbolinyl, phenanthridinyl, acridinyl, perimidinyl, phenanthrolinyl, phenazinyl, phenarsazinyl, phenothiazinyl, furazanyl, phenoxazinyl, isochromanyl, chromanyl, pyrrolidinyl, pyrrolinyl, imidazolidinyl, imidazolyl, pyrazolidinyl, pyrazolyl, piperidinyl, piperazinyl, indolyl, isoindolyl, quinuclidinyl, morpholinyl or oxazolidinyl. Also included are fused ring and spiro compounds containing, for example, the above heterocycles.

At used herein, the term "heteroaryl" refers to aromatic heterocyclic groups. Such heteroaryl groups

are preferably 5-6 membered monocyclic groups or 8-10 membered fused bicyclic groups. Examples of such heteroaryl groups include, but are not limited to pyridyl (pyridinyl), pyrimidinyl, furanyl (furyl),
5 thiazolyl, thienyl, pyrrolyl, pyrazolyl, imidazolyl, indolyl, isoxazolyl, oxazolyl, pyrazinyl, pyrimidinyl, pyridazinyl, benzofuranyl, benzothienyl, benzimidazolyl, quinolinyl, or isoquinolinyl.

10 As used herein, "pharmaceutically acceptable salts" refer to derivatives of the disclosed compounds wherein the parent compound of Formula I is modified by making acid or base salts of the compound of Formula I. Examples of pharmaceutically acceptable salts include,
15 but are not limited to, mineral or organic acid salts of basic residues such as amines; alkali or organic salts of acidic residues such as carboxylic acids; and the like.

20 "Prodrugs" are considered to be any covalently bonded carriers which release the active parent drug according to Formula I *in vivo* when such prodrug is administered to a mammalian subject. Prodrugs of the compounds of Formula I are prepared by modifying
25 functional groups present in the compounds in such a way that the modifications are cleaved, either in routine manipulation or *in vivo*, to the parent compounds. Prodrugs include compounds of Formula I wherein hydroxyl, amino, sulfhydryl, or carboxyl groups are
30 bonded to any group that, when administered to a mammalian subject, cleaves to form a free hydroxyl, amino, sulfhydryl, or carboxyl group respectively. Examples of prodrugs include, but are not limited to, acetate, formate and benzoate derivatives of alcohol and
35 amine functional groups in the compounds of Formula I, and the like. Examples of representative carboxyl and

amino prodrugs are included under the definition of R², R³, and Y.

The pharmaceutically acceptable salts of the compounds of Formula I include the conventional non-toxic salts or the quaternary ammonium salts of the compounds of Formula I formed, for example, from non-toxic inorganic or organic acids. For example, such conventional non-toxic salts include those derived from inorganic acids such as hydrochloric, hydrobromic, sulfuric, sulfamic, phosphoric, nitric and the like; and the salts prepared from organic acids such as acetic, propionic, succinic, glycolic, stearic, lactic, malic, tartaric, citric, ascorbic, pamoic, maleic, hydroxymaleic, phenylacetic, glutamic, benzoic, salicylic, sulfanilic, 2-acetoxybenzoic, fumaric, toluenesulfonic, methanesulfonic, ethane disulfonic, oxalic, isethionic, and the like.

The pharmaceutically acceptable salts of the present invention can be synthesized from the compounds of Formula I which contain a basic or acidic moiety by conventional chemical methods. Generally, the salts are prepared by reacting the free base or acid with stoichiometric amounts or with an excess of the desired salt-forming inorganic or organic acid or base in a suitable solvent or various combinations of solvents.

The pharmaceutically acceptable salts of the acids of Formula I with an appropriate amount of a base, such as an alkali or alkaline earth metal hydroxide e.g. sodium, potassium, lithium, calcium, or magnesium, or an organic base such as an amine, e.g., dibenzylethylenediamine, trimethylamine, piperidine, pyrrolidine, benzylamine and the like, or a quaternary ammonium hydroxide such as tetramethylammonium hydroxide and the like.

As discussed above, pharmaceutically acceptable salts of the compounds of the invention can be prepared

by reacting the free acid or base forms of these compounds with a stoichiometric amount of the appropriate base or acid, respectively, in water or in an organic solvent, or in a mixture of the two;
5 generally, nonaqueous media like ether, ethyl acetate, ethanol, isopropanol, or acetonitrile are preferred. Lists of suitable salts are found in Remington's Pharmaceutical Sciences, 17th ed., Mack Publishing Company, Easton, PA, 1985, p. 1418, the disclosure of
10 which is hereby incorporated by reference.

The disclosures of all of the references cited herein are hereby incorporated herein by reference in their entirety.

15

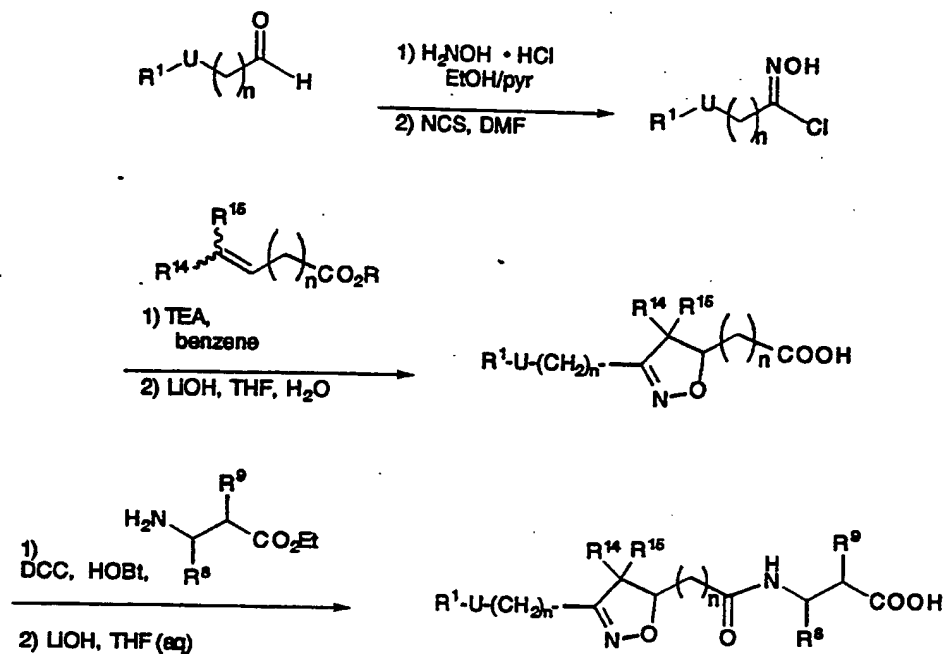
Synthesis

The compounds of the present invention can be prepared in a number of ways well known to one skilled in the art of organic synthesis. The compounds of the
20 present invention can be synthesized using the methods described below, together with synthetic methods known in the art of synthetic organic chemistry, or variations thereon as appreciated by those skilled in the art. Preferred methods include, but are not limited to, those
25 described below. All references cited herein are hereby incorporated in their entirety herein by reference.

Compounds of Formula I wherein the central heterocycle is a 3,5-disubstituted isoxazoline ring can be conveniently prepared by dipolar cycloaddition of
30 nitrile oxides with appropriate dipolarophiles (for reviews of 1,3-dipolar cycloaddition chemistry, see 1,3-Dipolar Cycloaddition Chemistry (Padwa, ed.), Wiley, New York, 1984; Kanemasa and Tsuge, Heterocycles 1990, 30, 719). The requisite nitrile oxides are in turn prepared
35 from the corresponding aldehydes via the intermediate oximes.

Scheme I illustrates one synthetic sequence which will provide the 3,5-isoxazolines of this invention. An appropriately substituted hydroxylamine is treated with NCS in DMF according to the method of Liu, et al. (J. Org. Chem. 1980, 45, 3916). The resulting hydroximinoyl chloride is then dehydrohalogenated in situ using TEA to give a nitrile oxide, which undergoes a 1,3-dipolar cycloaddition to a suitably substituted alkene to afford the isoxazoline. Alternatively, the oxime may be oxidatively chlorinated, dehydrochlorinated and the resulting nitrile oxide trapped by a suitable alkene under phase transfer conditions according to the method of Lee (Synthesis 1982, 508).

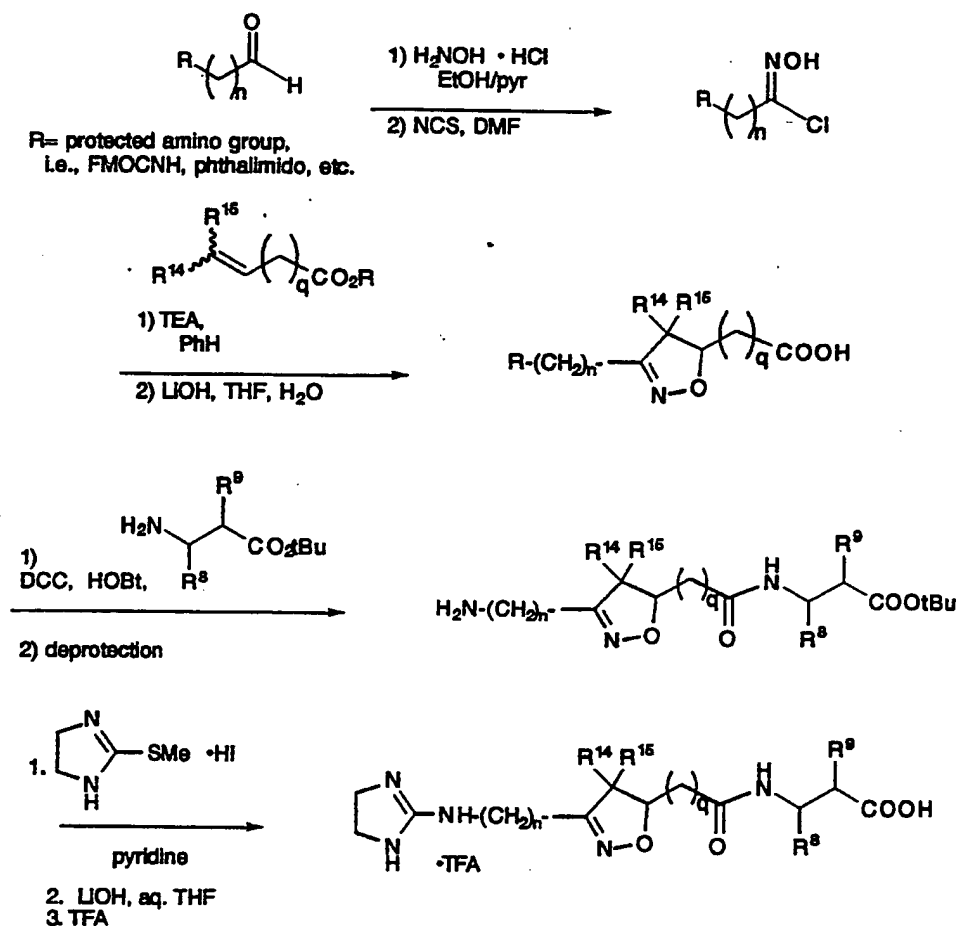
Subsequent hydrolysis of the ester using conventional methods known to one skilled in the art of organic synthesis gives the desired acids. Coupling of the resulting acids to appropriately substituted α - or β -amino esters affords an intermediate which can be deprotected to give compounds of Formula I. The coupling is carried out using any of the many methods for the formation of amide bonds known to one skilled in the art of organic synthesis. These methods include but are not limited to conversion of the acid to the corresponding acid chloride, or use of standard coupling procedures such as the azide method, mixed carbonic acid anhydride (isobutyl chloroformate) method, carbodiimide (dicyclohexylcarbodiimide, diisopropylcarbodiimide, or water-soluble carbodiimides) method, active ester (p-nitrophenyl ester, N-hydroxysuccinic imido ester) method, carbonyldiimidazole method, phosphorus reagents such as BOP-Cl. Some of these methods (especially the carbodiimide) can be enhanced by the addition of 1-hydroxybenzotriazole.

Scheme I

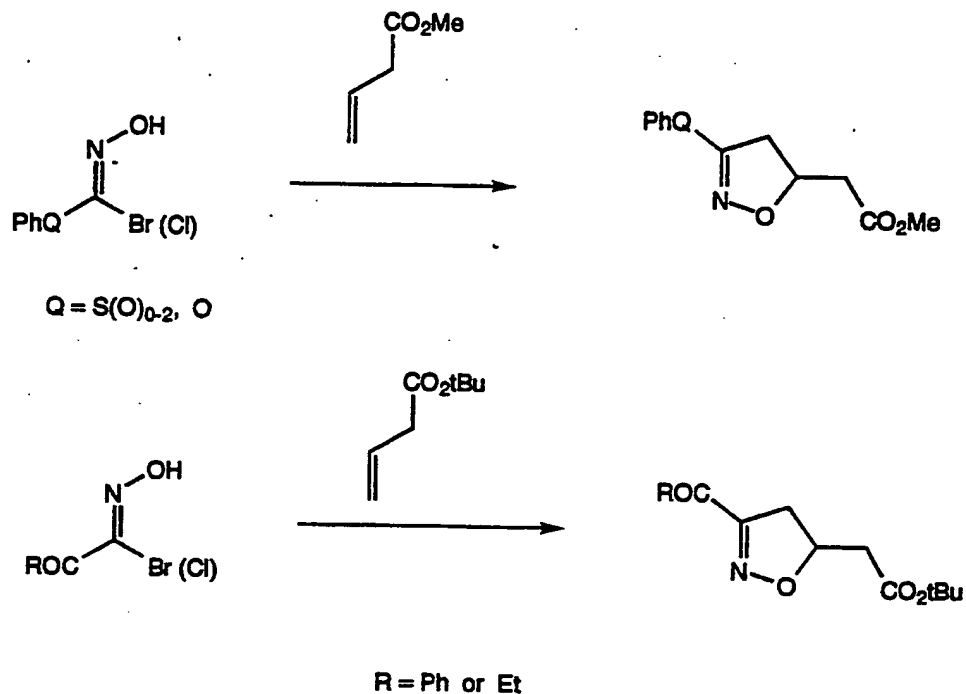
- 5 Alternately, as depicted in Scheme Ia, the above sequence can be carried out on an aldehyde bearing a suitably protected functional group which can be converted into R¹ after elaboration of the right hand side of the target molecules.

10

Scheme Ia



- 5 Additional isoxazolinyl acetates useful as starting materials for the preparation of compounds of Formula I, wherein V is -(phenyl)-Q- and Q is other than a single bond, can be prepared by cycloaddition of a suitably substituted chloro or bromooxime with an ester of vinyl
- 10 acetic acid as shown in Scheme Ib using literature methods or modifications thereof. (D. P. Curran & J. Chao, J. Org. Chem., 1988, 53, 5369-71; J. N. Kim & E. K. Ryu, Heterocycles, 1990, 31, 1693-97).

Scheme Ib

5 The compounds of the present invention wherein Y is
 an oxyalkoxy group, e.g. alkoxycarbonyloxyalkoxy, may be
 prepared by reacting a suitably protected carboxylic
 acid of Formula I with an e.g. an alkoxycarbonyloxyalkyl
 chloride in the presence of an iodide source, such as
 10 tetrabutylammonium iodide or potassium iodide, and an
 acid scavenger, such as triethylamine or potassium
 carbonate, using procedures known to those skilled in
 the art.

15 The appropriately substituted racemic β -amino acids
 may be purchased commercially or, as is shown in Scheme
 II, Method 1, prepared from the appropriate aldehyde,
 malonic acid and ammonium acetate according to the
 procedure of Johnson and Livak (J. Am. Chem. Soc. 1936,
58, 299). Racemic β -substituted- β -amino esters may be
 20 prepared through the reaction of dialkylcuprates or
 alkylolithiums with 4-benzoyloxy-2-azetidinone followed

by treatment with anhydrous ethanol (Scheme I, Method 2) or by reductive amination of β -keto esters as is described in published PCT patent application WO9316038. (Also see Rico et al., J. Org. Chem. 1993, 58, 7948-51.)

5 Enantiomerically pure β -substituted- β -amino acids can be obtained through the optical resolution of the racemic mixture or can be prepared using numerous methods, including: Arndt-Eistert homologation of the corresponding α -amino acids as shown in Scheme II,

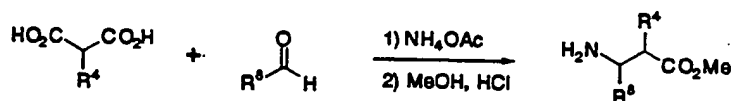
10 Method 3 (see Meier, and Zeller, Angew. Chem. Int. Ed. Engl. 1975, 14, 32; Rodriguez, et al. Tetrahedron Lett. 1990, 31, 5153; Greenlee, J. Med. Chem. 1985, 28, 434 and references cited within); and through an enantioselective hydrogenation of a dehydroamino acid as

15 is shown in Scheme II, Method 4 (see Asymmetric Synthesis, Vol. 5, (Morrison, ed.) Academic Press, New York, 1985). A comprehensive treatise on the preparation of β -amino acid derivatives may be found in published PCT patent application WO 9307867, the

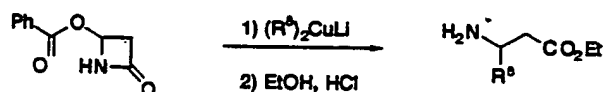
20 disclosure of which is hereby incorporated by reference.

Scheme II

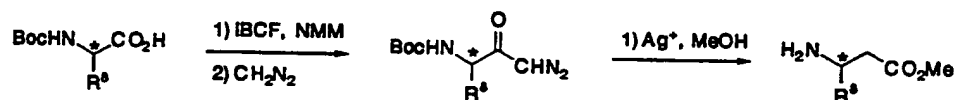
Method 1



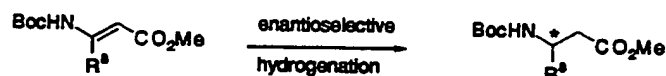
Method 2



Method 3



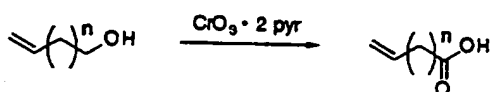
Method 4



5 The synthesis of N²-substituted diaminopropionic acid derivatives can be carried out via Hoffman rearrangement of a wide variety of asparagine derivatives as described in Synthesis, 266-267, (1981).

10 The dipolarophiles used to prepare the compounds of this invention may be prepared by numerous methods. The ω-alkenoic ester class of dipolarophile may be purchased commercially or prepared by oxidation of the corresponding ω-alkenols by the method of Corey and Schmidt (Tetrahedron Lett. 1979, 399, Scheme III).

15

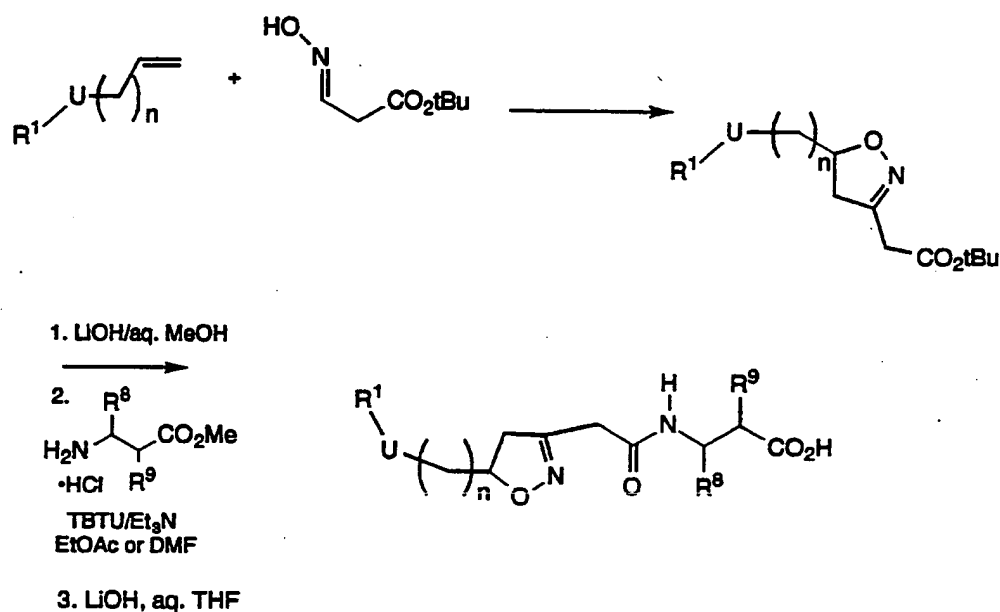
Scheme III

20

Synthesis of compounds of Formula I which incorporate the isoxazoline ring in the reverse

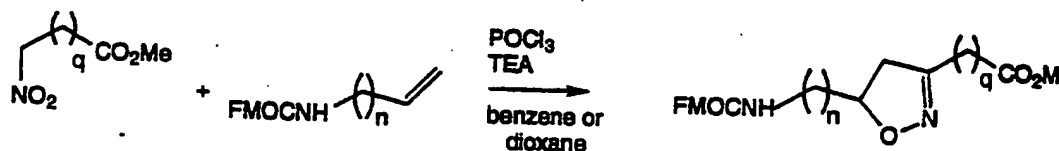
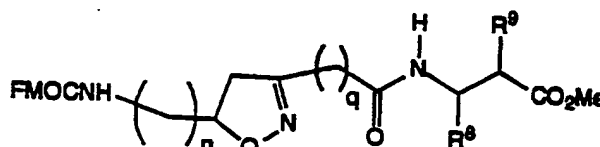
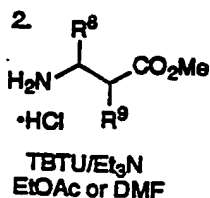
orientation, i.e., a 5,3-disubstituted isoxazoline ring, is shown in Scheme IV. Cycloaddition of an appropriately substituted alkene with t-butylformyloxime using the method described by Gree et al. (Bioorganic and Med. Chem. Lett., 1994, 253) provides the intermediate t-butyl [5-substituted isoxazolin-3-yl]acetate. This ester can be converted to compounds of Formula I using the methods described herein.

10 Scheme IV

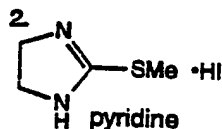
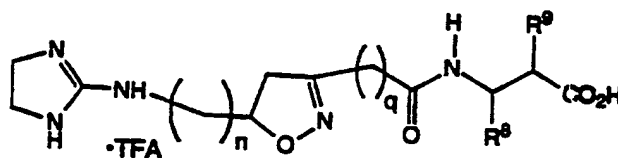


15 Alternately, as illustrated in Scheme IVa, the reverse isoxazolines may be prepared by reaction of an appropriate nitro ester with an appropriately substituted alkene in the presence of a suitable dehydrating agent such as phenylisocyanate or phosphorus oxychloride in the presence of an organic amine base,

20 such as triethylamine or diisopropylethylamine.

Scheme IVa:1. LiOH/aq. MeOH 

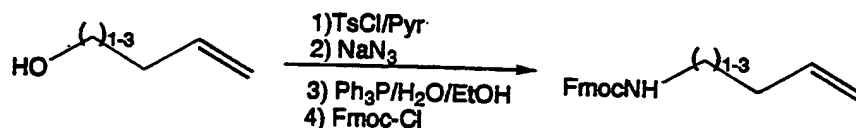
1. piperidine

3. LiOH, aq. THF
4. TFA

- 5 N-protected aminoalkenes useful in the synthesis of compounds of this invention can be prepared from the commercially available alcohols as shown in Scheme IVb, via reaction with a suitable activating agent such as p-toluenesulfonyl chloride in the presence of a base such as pyridine, followed by displacement with sodium azide in a suitable solvent such as DMF. Reduction of the azide by the action of triphenylphosphine in the presence of water (for example see, Scriven, E. F.V., Turnbull, K., Chemical Rev. 1988, 88, 297-360, and the
- 10

references therein) provides an amine which is suitably protected, for example, Fmoc, Boc or phthalimide group according to literature procedures. (Protecting Groups in Organic Synthesis 2nd Ed. Green, T. W., Wits, P. G. M. pp 309-406. 1991 John Wiley & Sons, Inc. NY)

Scheme IVb



10

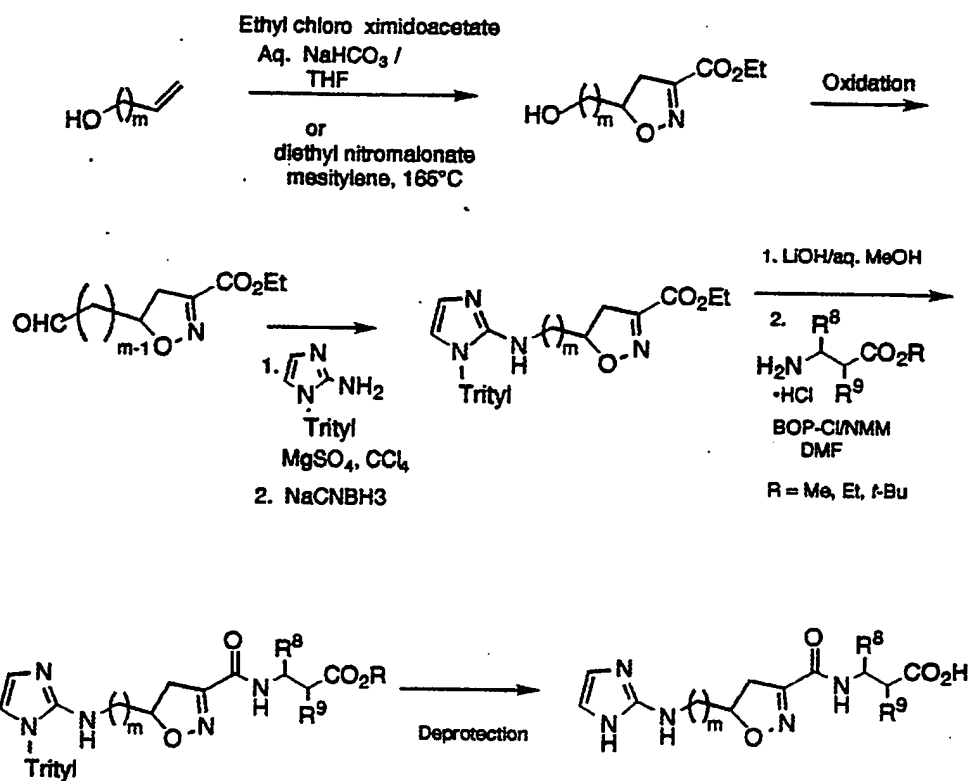
The appropriate nitroesters are available from commercial sources or can be synthesized according to literature methods (Seebach, D. et al., *Chem. Ber.* **1982**, 115, 1705-1720; Chaser, D.W., *Syn. Comm.* **1982**, 841-842).

Additional methods for the preparation of compounds of the present invention containing the isoxazoline ring in the reverse orientation are outlined in Scheme V. An appropriate ω -alkenol can be reacted with commercially available ethyl chlorooximidoacetate in a suitable solvent, such as tetrahydrofuran or methylene chloride, in the presence of a suitable base, such as aqueous sodium bicarbonate or triethylamine, to provide the isoxazoline. Alternately the same intermediate is prepared by heating the alkenol in the presence of diethylnitromalonate in refluxing mesitylene or decalin, by the method of Shimizu et al. (*Bull. Chem. Soc. Jpn.* **1985**, 58, 2519-2522.) Oxidation of the resulting alcohol the corresponding aldehyde can be achieved by numerous methods described in the literature (for example see Comprehensive Organic Transformations by Larock, R.C., p 604, 605, 607-613. VCH publishers, New York, New York, 1989). Reductive amination of the intermediate aldehyde (for suitable methods see, Abdel-Magid, A. F.,

- Maryanoff, C. A., and Carson, K.G., *Tetrahedron Lett.*, 1990, 31, 5595-5598, and references contained therein) with a variety of heteroaryl amines, which may additionally contain suitable protecting groups,
- 5 provides the substituted amines. Alternatively, depending on the nature of the heterocyclic amine, the reductive amination can be carried out in a two step procedure, wherein initial formation of an imine is carried out by treatment of the aldehyde with the
- 10 desired amine in the presence of a dehydrating agent such as magnesium sulfate, sodium sulfate, or molecular sieves, in a suitable solvent such as carbon tetrachloride, methylene chloride, benzene or toluene (for example see, *Modern Synthetic Reactions* 2nd ed.
- 15 House, H. O., Benjamin/Cummings Publishing Co, Menlo Park, Ca., 1972.). The imine is then subsequently reduced with a variety of reducing agents such as sodium borohydride, sodium cyanoborohydride, or sodium triacetoxymethylborohydride, in a suitable solvent such as
- 20 methanol, ethanol, tetrahydrofuran, dioxane or 1,2-dichloroethane, to provide the desired amines.

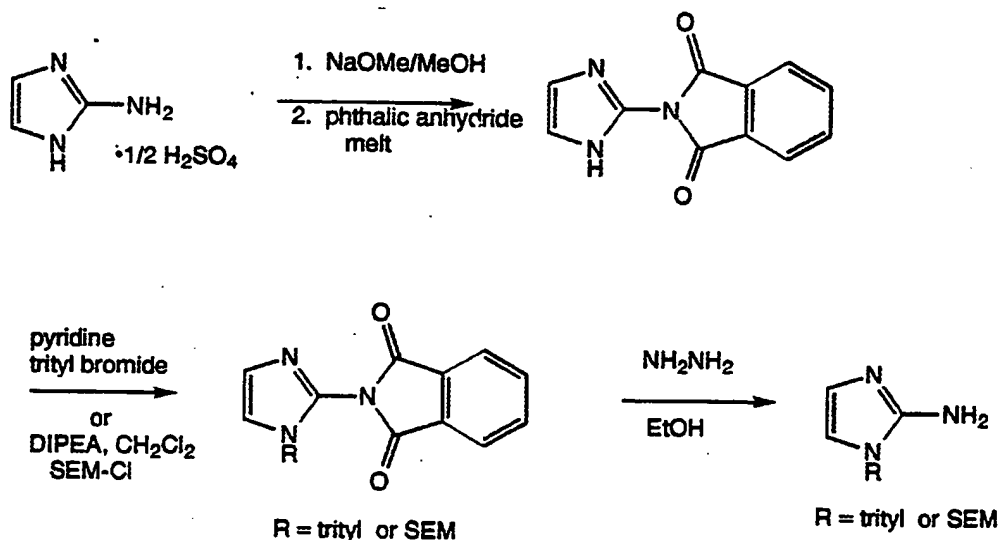
- Hydrolysis of the ester using conventional methods known to one skilled in the art of organic synthesis provides acid intermediates. Coupling of the resulting
- 25 acids to the appropriately substituted α - or β -amino ester is accomplished using standard coupling reagents, as described above. The esters may be saponified or in the case of tert-butyl esters the acid may be produced either by the action of trifluoroacetic acid with or
- 30 without an inert solvent such as methylene chloride, or by the action of anhydrous HCl in a solvent such as ether or dioxane. Additional protecting groups may be removed by methods known to one skilled in the art (for example see, *Protective Groups in Organic Synthesis*
- 35 2nd,ed. Greene, T. W., and Wuts, P. G. M., John Wiley & Sons, Inc. New York, 1991).

Scheme V:



A convenient preparation of suitably protected 2-aminoimidazoles is outlined in Scheme Va.

Scheme Va:



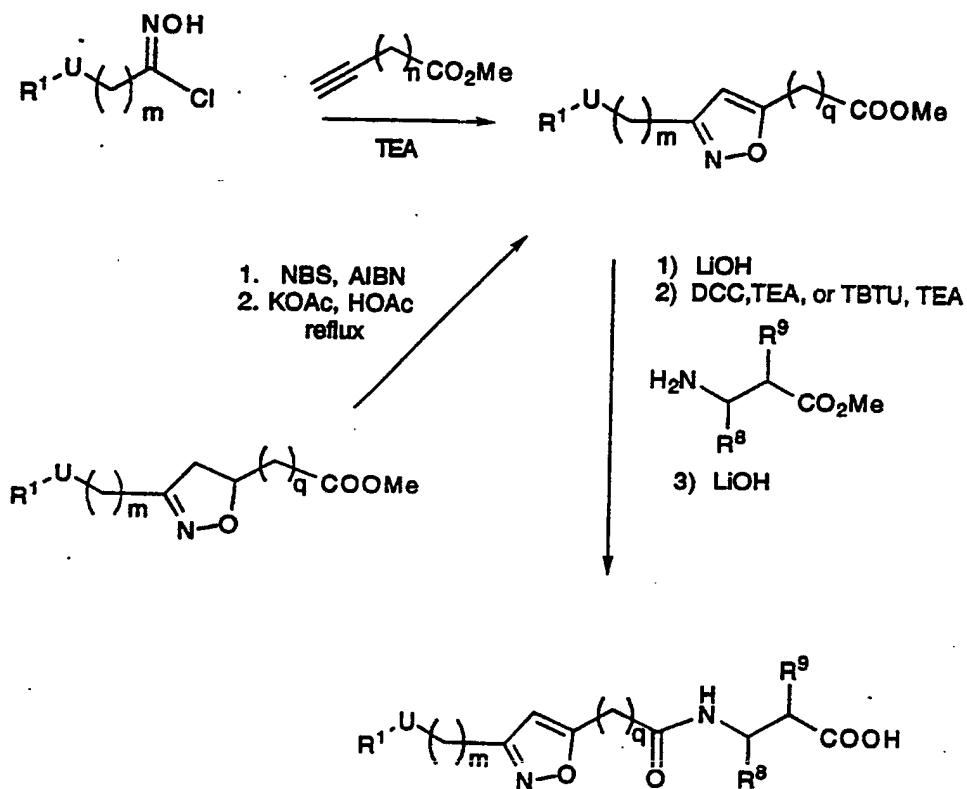
5

Compounds of formula I wherein b is a double bond can be prepared using one of the routes depicted in Scheme VI. Bromination followed by subsequent
10 dehydrobromination of a suitably substituted methyl 3-(cyanophenyl)isoxazolin-5-ylacetate, prepared as described above, using the method of Elkasaby & Salem (Indian J. Chem., 1980, 19B, 571-575) provides the
15 corresponding isoxazole intermediate. Alternately, this intermediate can be obtained by 1,3-dipolar cycloaddition of a cyanophenyl nitrile oxide (prepared from the corresponding chlorooxime as described in Scheme I) with an appropriate alkyne to give the
20 isoxazole directly. Hydrolysis of the ester using conventional methods known to one skilled in the art of organic synthesis provides the acid intermediates. Coupling of the resulting acids to an appropriately substituted α - or β -amino ester is accomplished using

standard coupling reagents, as described above.
Saponification gives the acids.

Scheme VI

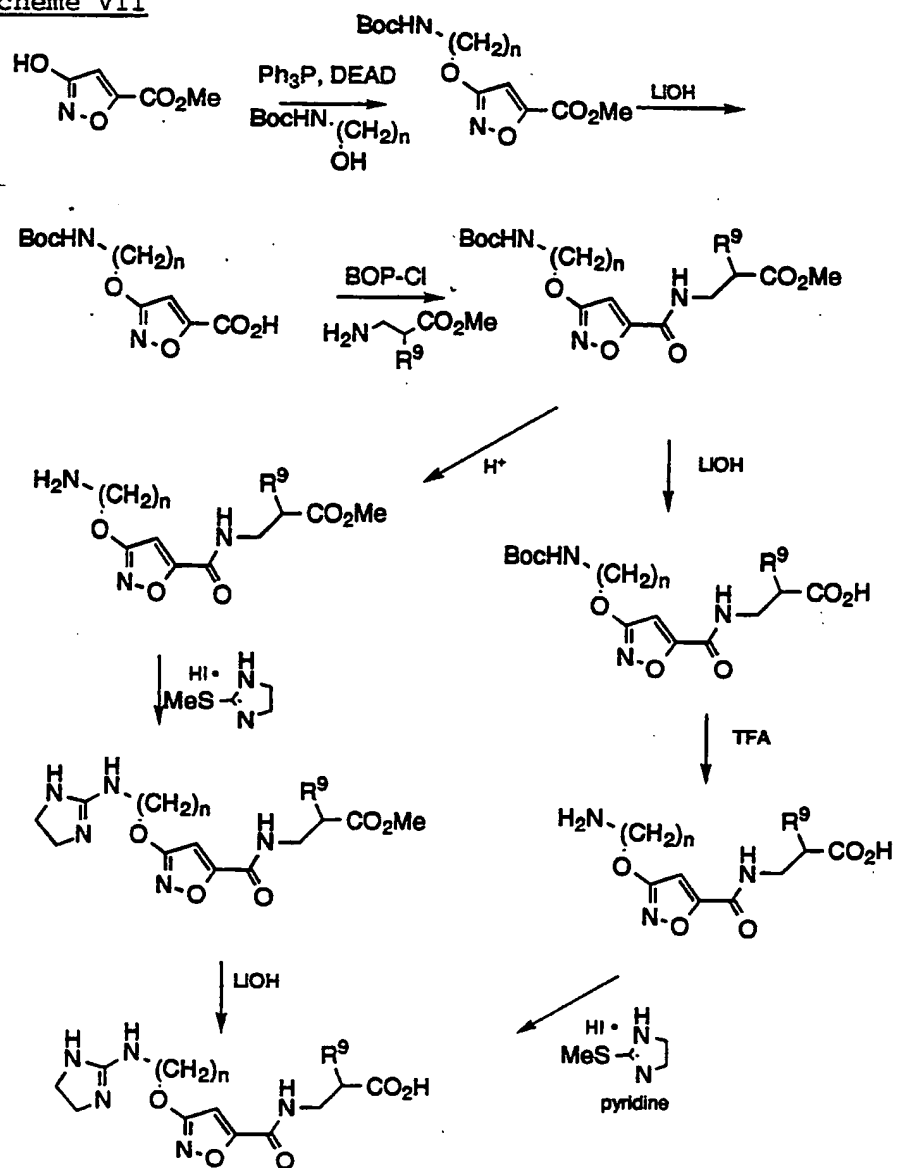
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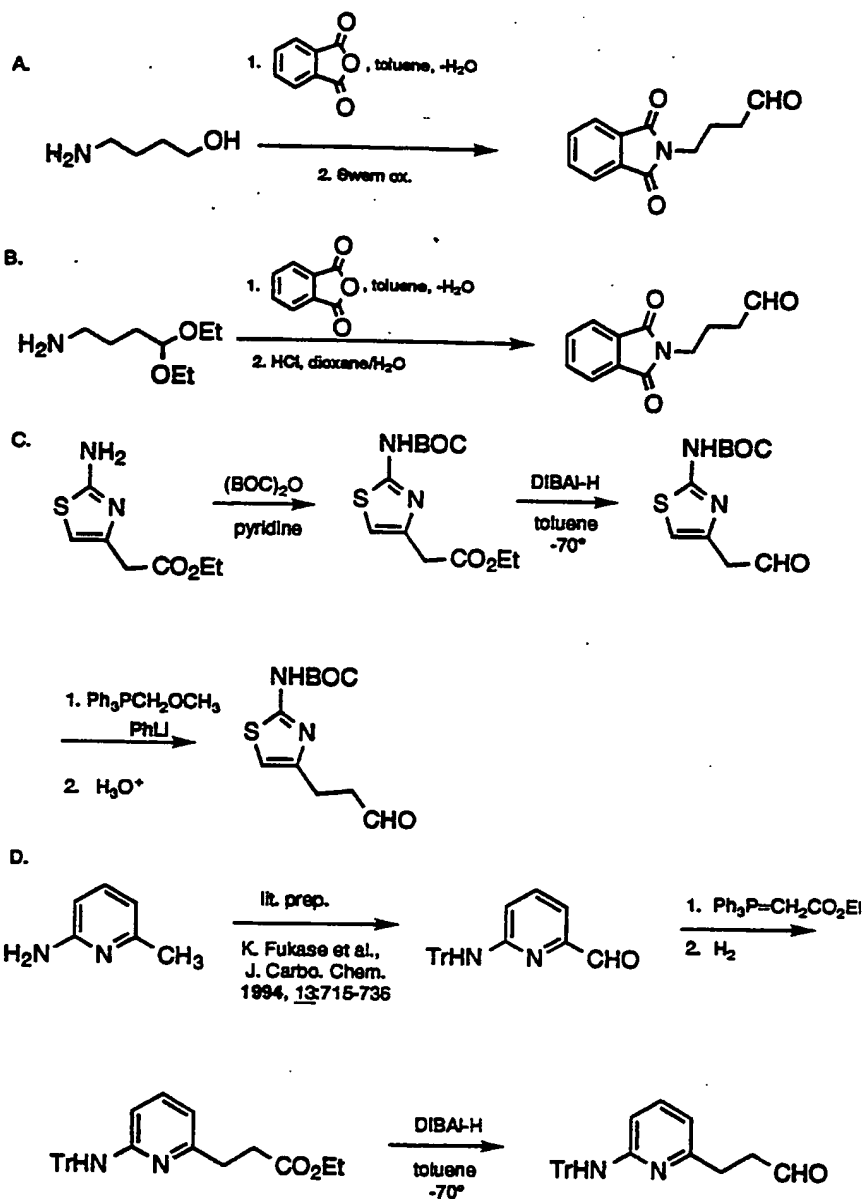
Compounds of Formula I wherein b is a double bond and Q is oxygen can be prepared from commercially available
10 methyl 3-hydroxy-5-isoxazolecarboxylate as illustrated in Scheme VII. Coupling of the hydroxy group to a suitably N-protected amino alcohol can be achieved in one step under Mitsunobu reaction conditions (Hughes,
D.L.; Organic Reactions, Volume 42, John Wiley and Sons,
15 1992, pages 335-656). Alternately, a two step process of activation of the N-protected aminoalcohol as an aryl or alkyl sulfonate ester or by conversion to halide followed by alkylation of the hydroxyisoxazole gives the same result. Bases suitable for this reaction include

alkaline hydrogen carbonates, alkaline carbonates, cesium carbonate, alkaline hydrides, and alkaline alcoholates such as sodium ethoxide and potassium t-butoxide. The reaction can be run in a number of
5 different solvents including lower alkyl and branched alcohols, ethereal solvents, or halocarbons, but it proceeds most readily in polar aprotic solvents such as DMF and DMSO. Saponification of the ester using standard conditions known to one skilled in the art
10 provides an acid intermediate which can be converted using the methods described above into compounds of Formula I.

Scheme VII



5 Additional aldehydes useful for the preparation of compounds of formula I in the methods depicted in schemes I-VII can be prepared as illustrated in Scheme VIII below:

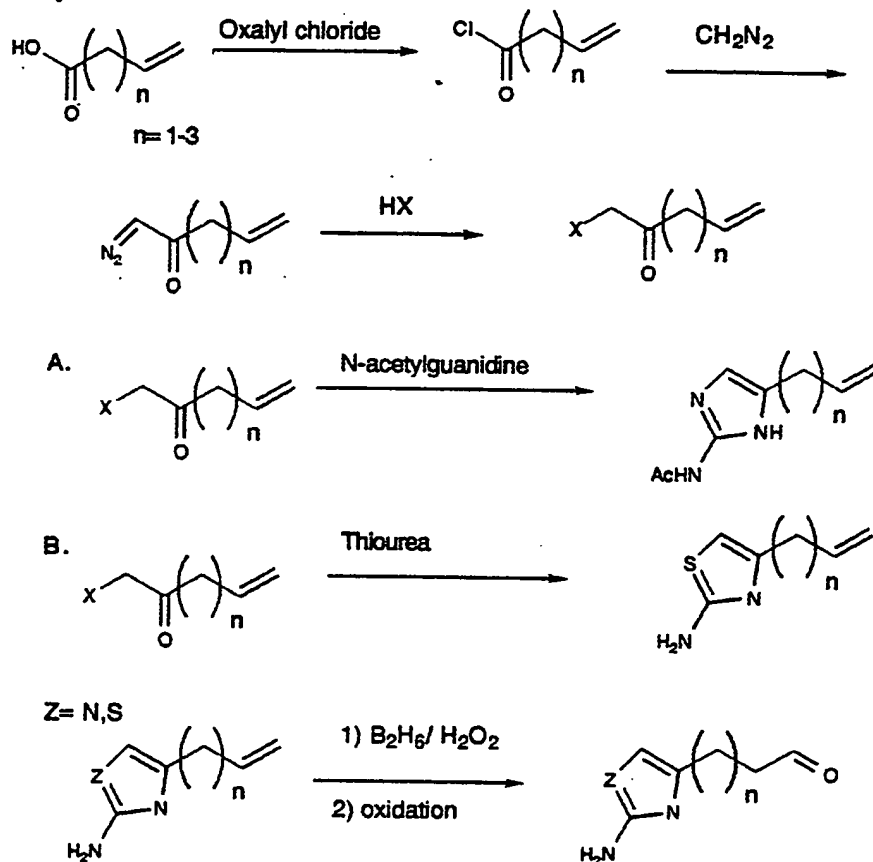
Scheme VIII

- 5 Heterocyclic alkenes and aldehydes useful as intermediates for the preparation of compounds of formula I in the methods depicted in Schemes I-VII can be prepared as illustrated in Scheme VIIIa and VIIIb. The carboxylic acids prepared in scheme III, can be

converted to an acid halide, by a variety of methods, such as treatment with oxalyl chloride or thionyl chloride either neat or in the presence of a suitable solvent such as methylene chloride or toluene, as outlined in the literature (for example, see Comprehensive Organic Transformations by Larock, R.C., p 964-965. VCH publishers, New York, New York, 1989). Treatment of the acid chloride with diazomethane in a suitable solvent such as ether, or dioxane, to form the diazoketone, followed by treatment with HBr (for example, see Comprehensive Organic Transformations by Larock, R.C., p 346. VCH publishers, New York, New York, 1989), provides versatile intermediates for the synthesis of many heterocycles. The examples shown in scheme VIIIA, are for illustration purposes and do not constitute a limitation on the scope of the invention. For example, as illustrated in method A, the α -haloketone can be treated with N-acetylguanidine in a suitable solvent such as acetonitrile from room temperature to reflux, or N,N-dimethylformamide from room temperature to 80°C according to the method of Little, T. L., and Webber, S. E. (*J. Org. Chem.*, 1994, 59, 7299-7305.) to provide a 2-amino-4-imidazole derivative. Alternatively, treatment of the α -haloketone with thiourea, in the presence of a suitable solvent such as toluene or acetone, at a temperature from 20°C to the boiling point of the solvent, according to the method of Patt, W. C., Skeeane, R. W., and Steinbaugh, B. A., (*Synth. Comm.* 1990, 20, 3097-3102) , provides the analogous 2-amino-5-thiazole derivative. The alkenes can be converted by a hydroboration-oxidation procedure (for example, see Comprehensive Organic Transformations by Larock, R.C., p 497-498. VCH publishers, New York, New York, 1989), to provide the alcohols. The alcohols can be oxidized to the corresponding aldehydes by numerous published methods (for example see

Comprehensive Organic Transformations by Larock, R.C., p 604, 605, 607-613. VCH publishers, New York, New York, 1989).

Scheme VIIIA



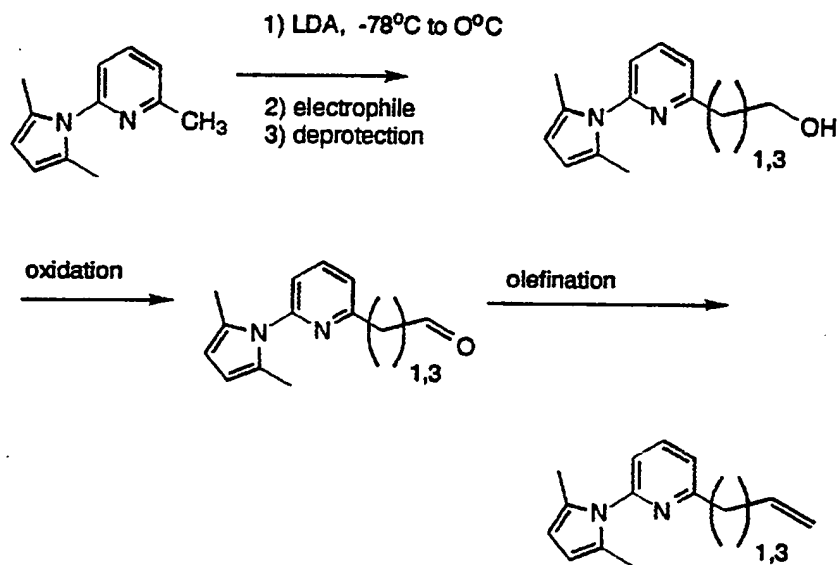
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Synthesis of pyridyl-containing alkenes and aldehydes, proceeds as depicted in Scheme VIIb. The amino group of 2-amino-6-methylpyridine is protected by treatment with 2,6-hexanedione, followed by deprotonation of the methyl group with lithium diisopropylamide according to the method of Breukelman, S. P., Meakins, G. D., and Tirel, M. D. (*J. Chem. Soc. Chem. Comm.* 1982, 800-801.). The lithio intermediate can be trapped with a variety of electrophiles such as

15

formaldehyde, ethylene oxide or 3-(tertbutyldimethylsilyloxy)-1-bromopropane to provide the alcohol intermediates. Oxidation of the alcohol to an aldehyde as described as described in detail above, followed by olefination reaction under any of a number of known conditions, such as, for example, a Wittig reaction or treatment with various titanium reagents provides the alkene intermediates (see Comprehensive Organic Transformations by Larock, R.C., p 173-184. VCH publishers, New York, New York, 1989).

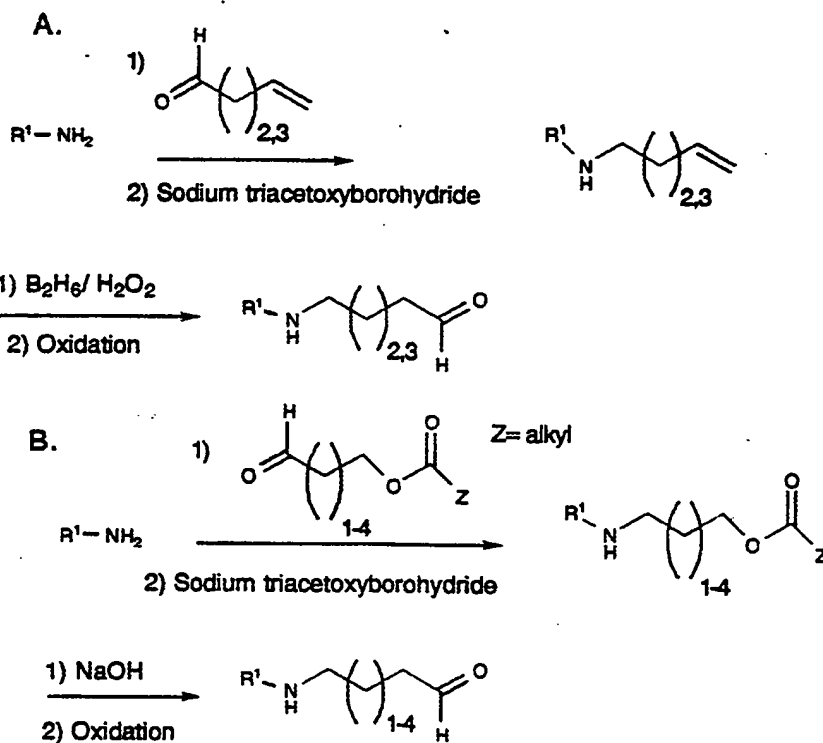
Scheme VIIIb



Alternately, reductive amination of the appropriate aldehyde intermediates with heterocyclic amines as shown in method A and method B of Scheme VIIIc, using methods described above, yields the desired amine intermediates. Hydroboration-oxidation of the double bond, followed by oxidation of the alcohol (vide supra) provides additional aldehyde intermediates useful for the synthesis of compounds of this invention. For heterocyclic amines unstable to the hydrogen peroxide required in the hydroboration oxidation procedure, the

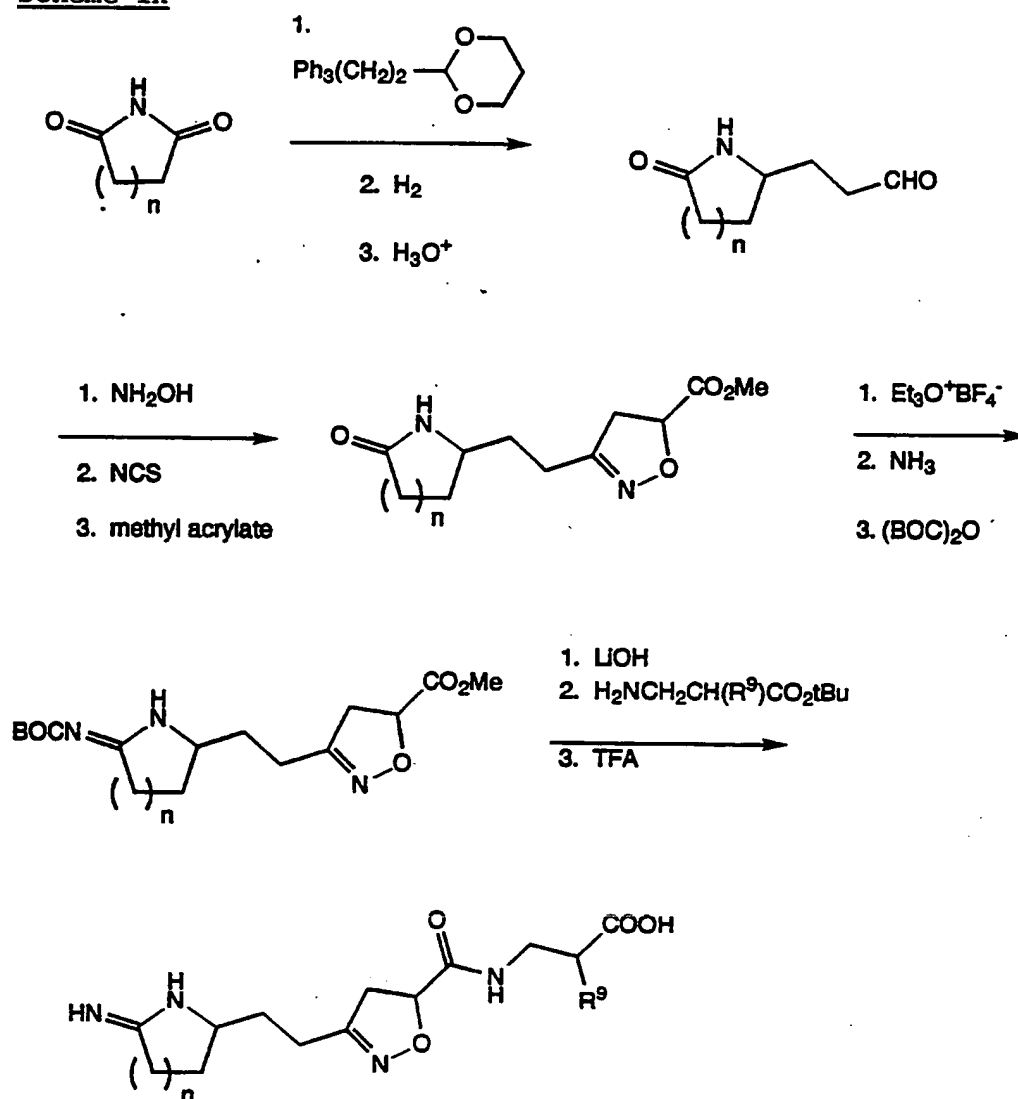
reductive amination can be carried out on appropriate esterified ω -hydroxy aldehydes, as outlined in method B. Hydrolysis of the esters and oxidation of the alcohol provides the aldehyde.

5

Scheme VIIIc

Compounds of Formula I wherein R^1 is 2-
 10 iminopyrrolidinyl, 2-iminopiperidinyl, or 2-
 iminoazepinyl can be prepared from the commercially
 available imides as outlined in Scheme IX.

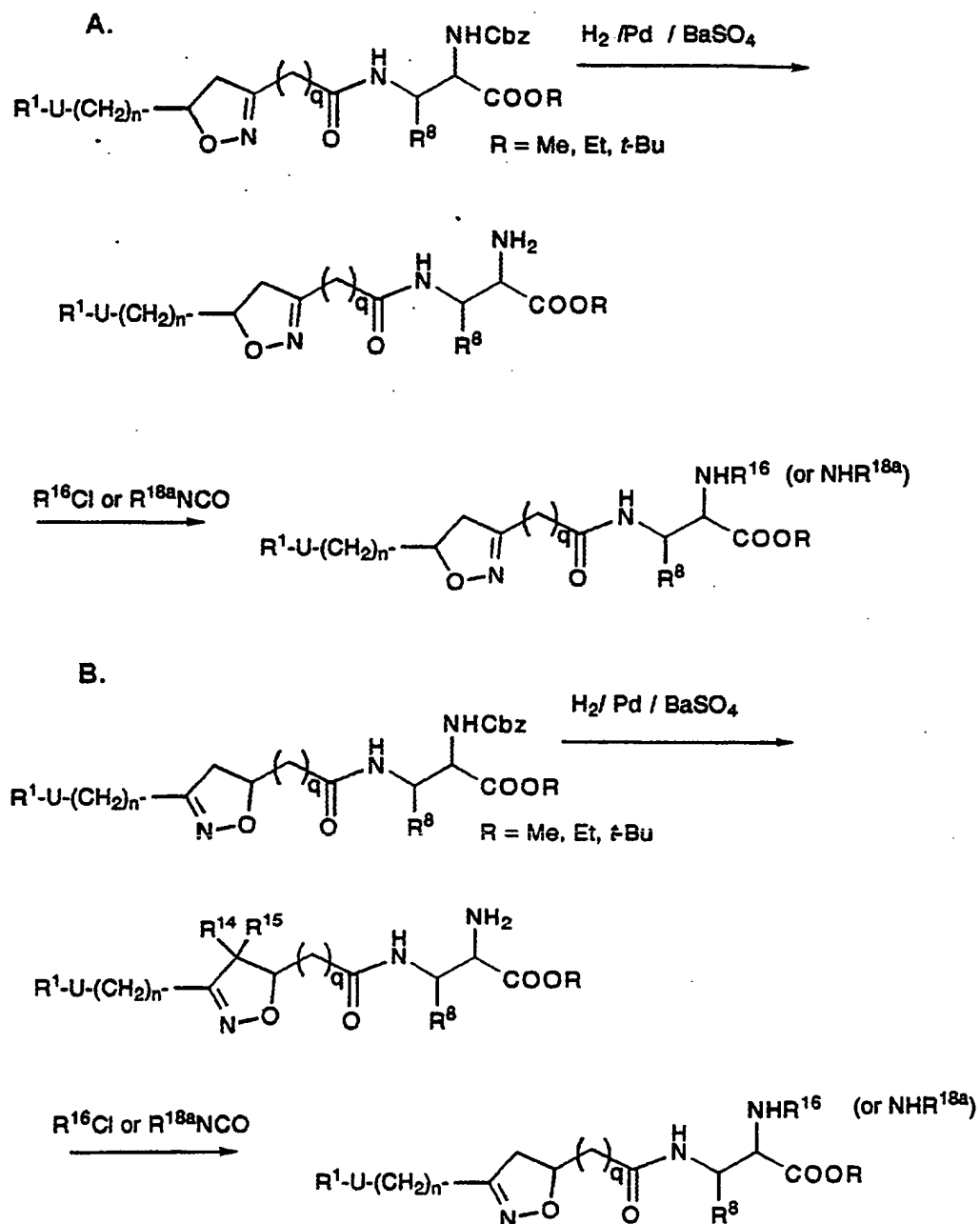
Scheme IX



5 Additional compounds of formula I where R⁹ is
-N(R¹⁶)R¹⁷ can be prepared from the compounds of Schemes
I, IA, IV, IVa, and IVb, wherein R¹⁶ is Cbz
(benzyloxycarbonyl), is shown in Scheme X. Selective
removal of the Cbz group may be accomplished by
10 hydrogenation using palladium suspended on barium
sulfate as the catalyst in a suitable solvent such as
methanol or ethanol, with or without a co-solvent, by

the method of Nikam, S. S., Kornberg, B.E., Johnson, D.R., and Doherty, A, M. (*Tetrahedron Lett.* 1995, 36, 197-200). Using this method, the Cbz group can be removed with minimal to no cleavage of the N-O bond
5 contained in the isozazoline rings shown in Scheme X example A, and Scheme X example B.

The resulting amines can be converted to additional compound of formula I by treatment with a wide variety of reagents, for example, acyl halides, chloroformates,
10 isocyanates, sulfonylchlorides, chlorosulfonamides, and sulfonylisocyanates, etc. using standard methods.

Scheme X

The detailed processes for preparing the compounds of Formula I are illustrated by the following Examples. It is, however, understood that this invention is not limited to the specific details of these examples. Melting points are uncorrected. Proton nuclear magnetic resonance spectra (¹H NMR) were measured in chloroform-d (CDCl₃) unless otherwise specified and the peaks are reported in parts per million (ppm) downfield from tetramethylsilane (TMS). The coupling patterns are reported as follows: s, singlet; d, doublet; t, triplet; q, quartet; qt, quintet; m, multiplet.

Example 2

3-[3-[3-(N-3,4,5,6-Tetrahydropyrimidin-2-yl)aminopropyl]-(5 R,S)-isoxazoline-5-yl]methylcarbonylamino-2-benzyloxycarbonylaminopropionic acid

A. 3-[3-[3-(N-3,4,5,6-Tetrahydropyrimidin-2-yl)aminopropyl]-(5 R,S)-isoxazoline-5-yl]methylcarbonylamino-2-benzyloxycarbonylaminopropionic acid: The compound of Ex. 16, Part G (199mg; 0.5mmol), methyl 3-amino-2-benzyloxycarbonylaminopropionate 147mg (0.5mmol), and triethylamine (100mg; 1mmol) in 3ml dimethylformamide was treated with (177mg; 0.55mmol) of O-(1H-benzotriazol-1-yl)-N,N,N',N'-tetramethyluronium tetrafluoroborate (TBTU) and the mixture was stirred at room temperature for 18 hours. TLC indicated no starting material; the volatiles were removed under high vacuum. The residue was purified by flash chromatography; 55g silica gel column using 8% MeOH:CHCl₃ followed by 20% to afford the desired product as a white solid (252mg; 79.9% yield). NMR indicated contamination with triethylamine salt. The compound will be used in the next step without further purification. HRMS calcd. for C₂₄H₃₄N₆O₆ ([M+H]⁺): 503.261808; found: 503.259832.

- B. 3-[3-[3-(N-3,4,5,6-Tetrahydropyrimidin-2-yl)aminopropyl]-(5 R,S)-isoxazoline-5-yl)methylcarbonylamino-2-benzyloxycarbonylamino
5 propionic acid: A mixture of the compound of Ex. 2, Part A (100mg; 0.159mmol) and lithium hydroxide (12mg; 0.5mmol) in 2ml of a 1:1 methanol:water was stirred at room temperature for one hour. TLC indicated disappearance of starting material. The mixture was diluted with
10 water and washed with hexane. The aqueous layer was neutralized with 1N HCl (0.5mmol) and then stripped. The residue was purified on a LH20 size exclusion column using 100% methanol as an eluent. The product obtained was lyophilized from 2ml 1N HCl followed by 2ml
15 distilled water. The desired product was obtained as an off-white solid (59mg; 70.7% yield). ¹H NMR (300MHz CDCl₃): 1.721-1.785 (m, 4H); 2.294-2.408 (m, 3H); 2.499 (dd, 1H, J₁=14.28Hz, J₂=6.59Hz); 2.675 (dd, 1H, J₁=17.2Hz, J₂=6.23Hz); 2.984 (dd, 1H, J₁=17.2Hz, J₂=10.25Hz); 3.125 (t, 2H, J=6.59Hz); 3.225 (m, 4H);
20 3.343-3.558 (m, 2H); 4.214 (m, 1H); 4.768 (m, 1H); 4.973 (s, 2H); 7.145-7.230 (m, 5H). HRMS calcd. for C₂₃H₃₂N₆O₆ ([M+H]⁺): 489.246158; found: 489.247644.

25

Example 16

- 3-[3-[3-(N-3,4,5,6-Tetrahydropyrimidin-2-yl)aminopropyl]-(5 R,S)-isoxazolin-5-yl)methylcarbonylamino-2-phenylsulfonylamino
30 propionic acid

- A. N-(4-Hydroxybutyl)phthalimide: A solution of 4-amino-1-butanol (5.616g; 63mmol) and triethylamine (12.3ml; 88.2mmol) in 130ml tetrahydrofuran was treated with N-carbethoxyphthalimide (13.82g; 63mmol). The
35 mixture was refluxed for 18 hours. TLC showed the formation of product (1:1 Ethyl acetate:Hexane Rf=0.3).

The mixture was diluted with ethyl acetate and washed with water. The aqueous layer was extracted with more ethyl acetate and the organic layers combined, dried (MgSO_4), filtered, concentrated and the residue purified
5 by flash chromatography; 200g silica gel column using 2:3 ethyl acetate:Hexane followed by 1:1 to provide N-(4-hydroxybutyl)phthalimide as a white solid (9.108g; 65.9% yield). ^1H NMR (300 MHz, CDCl_3): 1.426 (t, 2H, $J=4.93\text{Hz}$); 1.597-1.663 (m, 2H); 1.738-1.813 (m, 2H);
10 3.668-3.768 (m, 4H); 7.715 (m, 2H); 7.838 (m, 2H).

B. N-(4-Oxobutyl)phthalimide: Oxalyl Chloride (4.01ml; 46mmol) in 90ml dichloromethane was cooled at -78°C in a dry ice-acetone bath. Dimethylsulfoxide (4.26ml;
15 60mmol) in 22ml dichloromethane was then added dropwise and the mixture stirred at -78°C for 30 minutes. N-(4-Hydroxybutyl)phthalimide (9.108g; 41.5 mmol) in 45ml dichloromethane was then added and the mixture stirred in the -78°C bath for 45 minutes. The mixture was then
20 warmed in a 0°C ice bath and stirred for one hour. Triethylamine (23g; 230mmol) in 23ml dichloromethane was then added and the stirred for an additional 30 minutes. The mixture was worked up by washing with water. The organic layer was separated, dried (MgSO_4), filtered,
25 concentrated and the residue purified by flash chromatography; 200g silica gel column using 1:3 ethyl acetate:Hexane to provide N-(4-oxobutyl)phthalimide as a white solid (7.469g; 82.8% yield). ^1H NMR (300 MHz, CDCl_3): 2.023 (m, 2H); 2.546 (dt, 2H, $J_1=7.324\text{Hz}$,
30 $J_2=1.098\text{Hz}$); 3.749 (t, 2H, $J=6.958\text{Hz}$); 7.734 (m, 2H); 7.845 (m, 2H); 9.777 (t, 1H, $J=1.099\text{Hz}$).

C. 4-(N-Phthaloyl)aminobutyraldehyde oxime: N-(4-oxobutyl)phthalimide (7.46g; 34.3mmol) and triethylamine
35 (17.2g; 172mmol) in 75ml ethanol was treated with hydroxylamine hydrochloride (11.95g; 172mmol) and

stirred at room temperature for 2 hours. TLC indicated no starting material. The solvent was stripped off and the mixture diluted with ethyl acetate and washed with water. The organic layer was dried (MgSO_4), filtered, concentrated and the residue dried *in vacuo* to afford 4-(N-phthaloyl)aminobutyraldehyde oxime (7.469g; 73.9% yield). A 2:1 mixture of isomers was obtained and the following is data on the major isomer. ^1H NMR (300MHz, CDCl_3): 1.856-1.956 (m, 2H); 2.409-2.479 (dt, 2H, $J_1=7.691\text{Hz}$, $J_2=5.493\text{Hz}$); 3.713-3.762 (t, 2H, $J=7.324\text{Hz}$); 6.769 (t, 1H, $J=5.493\text{Hz}$); 7.720 (m, 2H); 7.836 (m, 2H).

D. tert-Butyl 3-[3-(N-Phthaloyl)aminopropyl]-(5R,S)-isoxazoline-5-yl acetate: N-Chlorosuccinimide (3.39g; 25.4mmol) and 1 drop of pyridine in 50ml chloroform was treated with 4-(N-phthaloyl)aminobutyraldehyde oxime (5.89g; 25.4 mmol) in 25ml chloroform added over a 5 minute period. After the mixture was completely in solution, it was stirred at room temperature for 1.5 hours. NMR was used to monitor the disappearance of starting material. The mixture was treated with tert-butyl-3-butenolate (5.42g; 38.1mmol) followed by triethylamine 2.70g (26.7mmol) added dropwise over a 2 hour period. The mixture was stirred at room temperature for 18 hours and worked up by washing with water, drying the organic layer (MgSO_4), filtering, and concentrating. The residue was purified by flash chromatography; 200g silica gel using 1:5 Ethyl acetate:Hexane followed by 1:3 to provide t-Butyl 3-[3-(N-Phthaloyl)aminopropyl]-(5R,S)-isoxazoline-5-yl acetate (7.469g; 63.7% yield). ^1H NMR (300MHz, CDCl_3): 1.430 (s, 9H); 1.967 (m, 2H); 2.355-2.476 (m, 3H); 2.624-2.723 (m, 2H); 3.103 (dd, 1H, $J_1=16.85\text{Hz}$, $J_2=10.25\text{Hz}$); 3.730 (t, 2H, $J=6.958\text{Hz}$); 4.820-4.879 (m, 1H); 7.712 (m, 2H); 7.813 (m, 2H).

E. tert-Butyl 3-(3-aminopropyl)-(5R,S)-isoxazoline-5-yl acetate: tert-Butyl 3-[3-(N-phthaloyl)aminopropyl]-(5R,S)-isoxazoline-5-yl acetate (6.025g; 16.2mmol) in 200ml ethanol was treated with hydrazine and the mixture stirred at room temperature for 18 hours. A thick white precipitate that had formed was filtered off and washed with more ethanol. The mother liquor was stripped and diluted with chloroform and washed with water. The organic layer was separated, dried (MgSO₄), filtered, concentrated and the residue (3.811g) purified by flash chromatography; 250g silica gel column using 10% methanol:chloroform to elute impurities and then 1:1 methanol:chloroform to provide t-Butyl 3-(3-aminopropyl)-(5R,S)-isoxazoline-5-yl acetate (1.0g; 25.5% yield). ¹H NMR (300MHz, CDCl₃): 1.398 (bs, 2H); 1.457 (s, 9H); 1.727 (m, 2H); 2.379-2.489 (m, 3H); 2.659-2.784 (m, 4H); 3.114 (dd, 1H, J₁=17.21Hz, J₂=10.25Hz); 4.816-4.919 (m, 1H). HRMS calcd. for C₁₂H₂₂N₂O₃ ([M+H]⁺): 243.170868; found: 234.170966.

F. tert-Butyl 3-[3-(N-3,4,5,6-tetrahydropyrimidin-2-yl)aminopropyl]-(5 R,S)-isoxazoline-5-ylacetate: (tert-Butyl 3-(3-aminopropyl)-(5R,S)-isoxazoline-5-yl acetate 990mg (4.09mmol) in 15ml pyridine was treated with 2-Methylthio-3,4,5,6-tetrahydropyrimidine hydroiodide 1.135g (4.4mmol) and the mixture stirred at reflux for 22 hours. TLC indicated no starting material. The mixture was stripped and pumped. The residue was purified by flash chromatography; 130g silica gel column using 2% MeOH:CHCl₃ followed by 4% and finally 6% to elute 923mg of t-Butyl 3-[3-(N-3,4,5,6-tetrahydropyrimidin-2yl)aminopropyl]-(5 R,S)-isoxazoline-5-ylacetate (49.9% yield). ¹H NMR (300MHz, CDCl₃): 1.460 (s, 9H); 1.897-2.001 (m, 4H); 2.435 (t, 2H, J=6.226Hz); 2.523 (dd, 1H, J₁=15.75Hz, J₂=6.59Hz); 2.662 (dd, 1H, J₁=16.11Hz, J₂=6.59Hz); 2.779 (dd, 1H,

$J_1=17.40\text{Hz}$, $J_2=7.69\text{Hz}$); 3.177 (dd, 1H, $J_1=17.40\text{Hz}$, $J_2=10.25\text{Hz}$); 3.299 (dt, 2H); 3.400 (m, 4H); 4.844-4.949 (m, 1H); 7.518 (s, 2H), 7.623 (t, 1H, $J=6.23\text{Hz}$). HRMS calcd. for $\text{C}_{16}\text{H}_{28}\text{N}_4\text{O}_3$ ($[\text{M}+\text{H}]^+$): 325.223966; found: 325.223355.

G. 3-[3-(N-3,4,5,6-tetrahydropyrimidin-2-yl)aminopropyl]-(5 R,S)-isoxazoline-5-ylacetic acid:
tert-Butyl 3-[3-(N-3,4,5,6-tetrahydropyrimidin-2-yl)aminopropyl]-(5 R,S)-isoxazoline-5-ylacetate (885mg; 1.96mmol) was treated with 1:1 dichloromethane: trifluoroacetic acid (20ml) and stirred at room temperature for one hour. TLC indicated no starting material. The mixture was stripped and pumped to afford 3-[3-(N-3,4,5,6-tetrahydropyrimidin-2-yl)aminopropyl]-(5 R,S)-isoxazoline-5-ylacetic acid as a brown solid (777mg; 100% yield). ^1H NMR (300MHz DMSO- d_6): 1.694 (m, 2H); 1.804 (m, 2H); 2.302 (t, 2H, $J=7.32\text{Hz}$); 2.511 (d, 2H, $J=6.59\text{Hz}$); 2.681 (dd, 1H, $J_1=17.21\text{Hz}$, $J_2=7.32\text{Hz}$); 3.037-3.152 (m, 3H); 3.231 (m, 4H); 4.693-4.794 (m, 1H); 7.456 (t, 1H, $J=5.13\text{Hz}$); 7.788 (s, 2H). HRMS calcd. for $\text{C}_{12}\text{H}_{20}\text{N}_4\text{O}_3$ ($[\text{M}+\text{H}]^+$): 269.161366; found: 269.161204.

H. Methyl 3-[3-[3-(N-3,4,5,6-tetrahydropyrimidin-2-yl)aminopropyl]-(5 R,S)-isoxazoline-5-yl]methylcarbonylamino-2-phenylsulfonylaminopropionate:
A solution of the compound of Ex. 16, part G (199mg; 0.5mmol), methyl 3-amino-2-phenylsulfonylaminopropionate (147mg; 0.5mmol), and triethylamine (100mg; 1mmol) in 3ml dimethylformamide was treated with 265mg (0.6mmol) of benzotriazol-1-yloxy-tris(dimethylamino)phosphonium hexafluorophosphate (BOP Reagent) and the mixture stirred at room temperature for 18 hours. TLC indicated no starting material; the mixture was pumped to remove most of the dimethylformamide. The residue was purified by flash chromatography; 75g silica gel column using 15%

methanol:chloroform to elute the desired product. NMR indicated contamination with triethylamine salt and some form of the BOP Reagent. The compound was then purified on a LH20 size exclusion column using 100% methanol as the eluent. 113mg of desired product was obtained with slight contamination from triethylamine salts (35.3% yield). This product was taken on to the next step without further purification.

- 10 I. 3-[3-[3-(N-3,4,5,6-Tetrahydropyrimidin-2-yl)aminopropyl]-(5 R,S)-isoxazoline-5-yl]methylcarbonylamino-2-phenylsulfonylamino
propionic acid: A mixture of the compound of Ex. 16, Part H (107mg; 0.168mmol) and lithium hydroxide (14mg; 0.6mmol)
15 in 2ml of a 1:1 methanol:water was stirred at room temperature for one hour. TLC indicated disappearance of the starting material. The mixture was diluted with water and washed with hexane. The aqueous layer was neutralized with 1N HCl (0.6mmol) and then stripped.
20 The residue was purified on a LH20 size exclusion column using 100% methanol as eluent. The product obtained was lyophilized from 2ml 1N HCl followed by 2ml distilled water. The desired product was obtained as an off-white solid (68mg; 76.2% yield). ¹H NMR (300 MHz CDCl₃):
25 1.646-1.797 (m, 4H); 2.244 (m, 3H); 2.322-2.403 (m, 1H); 3.005 (t, 2H, J=6.96Hz); 3.153-3.196 (m, 6H); 3.318 (d, 1H, J=5.86Hz); 3.424 (dd, 1H, J₁=13.73Hz, J₂=4.39Hz); 3.835 (m, 1H); 4.693 (m, 1H); 7.303-7.429 (m, 3H); 7.660 (m, 2H). HRMS calcd. for C₂₁H₃₀N₆O₆S ([M+H]⁺):
30 495.202580; found: 495.201869.

Example 56

- 2-benzyloxycarbonylamino-3-[[3-[4-[(N-imidazolin-2-yl)amino]butyl]-(5 R,S)-isoxazolin-5-yl]carbonylamino]-
35 propionic acid

A. 5-Phthalimidopentanol: A mixture of 10.317 g (100 mmol) 5-amino-1-pentanol and 14.812 g (100 mmol) phthalic anhydride in 200 mL toluene was stirred 18 h under nitrogen at reflux while employing a Dean-Stark trap for removal of water. The reaction was allowed to cool to room temperature and solvent was removed. The residue was flash column chromatographed (1;1 hexanes - ethyl acetate) to provide 19.77 g (84.0 mmol, 84 %) of a clear liquid; NMR(CDCl₃): 7.66-7.88 (m, 4H), 3.59-3.75 (m, 4H), 1.32-1.79 (m, 6H); Mass spectrum: m/z 234 (M + H).

B. 5-Phthalimidopentanal: A solution of 260 mL methylene chloride and 10.39 mL (108.22 mmol) oxalyl chloride was stirred in a 1000 mL round bottom flask under nitrogen at -78° C. Added over 10 min was 16 mL dimethyl sulfoxide. Next added over 5 min was 23.61 g (101.21 mmol) of the product obtained from Ex. 56, Step A in 60 mL methylene chloride and the mixture stirred for 15 min. Next added was 60 mL (325.0 mmol) triethylamine and the mixture allowed to warm to room temperature. The mixture was poured into water, extracted with three portions of methylene chloride which were combined, dried, filtered and stripped of solvent to provide 21.22 g (91.7 mmol, 90%) of a clear liquid; NMR(CDCl₃): 9.76 (t, 1H), 7.68-7.90 (m, 4H), 3.73 (t, 2H), 2.50 (t, 2H), 1.60-1.81 (m, 4H); Mass spectrum: m/z 232 (M + H).

C. 5-phthalimidopentanal oxime: A mixture of 20.60 g (89.08 mmol) of the product obtained from Ex. 56, Step B, 250 mL pyridine and 12.27 g (2 equivs) of hydroxylamine hydrochloride was stirred 18 hr under nitrogen at room temperature. Solvent was removed and the residue triturated under water. The resulting solid was filtered and suction dried to provide 12.22 g (49.62

mmol, 55%) of a white solid, mp = 120-123° C;
NMR(CDCl₃): 7.69-7.90 (m, 4H), 6.70 and 7.40 (two t, 1H), 7.03 (bs, 1H), 1.50-3.77 (m, 8H); Mass spectrum: m/z 247 (M + H).

5

D. tert-Butyl 3-[4-phthalimidobutyl]-isoxazolin-5-(R,S)-yl-carboxylate: A mixture of 3.50 g (14.212 mmol) of the product obtained from Ex. 56, Step C, 100 mL N,N-dimethylformamide and 1.897 g (14.212 mmol) N-chlorosuccinimide were stirred for 3 h at room temperature under nitrogen. Solvent was removed and the residue flash column chromatographed (2:1 hexanes - ethyl acetate) to provide 3.50 g (12.46 mmol, 87%) of a clear liquid; NMR(CDCl₃): 8.50 (bs, 1H), 7.69-7.88 (m, 4H), 3.70 (m, 2H), 2.58 (m, 2H), 1.70 (m, 4H); Mass spectrum: m/z 262 ((M + H) - H₂O). A mixture of 3.50 g (12.46 mmol) of the product thus obtained, 50 mL tetrahydrofuran, 25 mL water, 3.0 g (excess) t-butyl acrylate and 3.0 g (excess) sodium bicarbonate was stirred 48 h at room temperature under nitrogen. The mixture was poured into water and extracted with three portions of ethyl acetate. The combined organic layers were dried over anhydrous magnesium sulfate, filtered and solvent removed. The residue was flash column chromatographed (3:2 hexanes - ethyl acetate) to provide 2.98 g (8.00 mmol, 64%) of a clear liquid; NMR(CDCl₃): 7.70-7.86 (m, 4H), 4.83 (m, 1H), 3.72 (t, 2H), 3.15 (m, 2H), 2.42 (t, 2H), 1.60-1.82 (m, 4H), 1.48 (s, 9H); Mass spectrum: m/z 373 (M + H).

30

E. tert-Butyl 3-[4-[(N-imidazolin-2-yl)amino]butyl]-(5R,S)-isoxazolin-5-ylcarboxylate, hydroiodide: A mixture of 2.92 g (7.80 mmol) of the product obtained from Ex. 56, Part D, 100 mL absolute ethanol and 0.75 mL (3 equivs) hydrazine was stirred for 18 h at room temperature under nitrogen. Water was added until all

35

dissolved. The mixture was extracted with three portions of ethyl acetate. The combined organic layers were dried over anhydrous magnesium sulfate, filtered and solvent was removed. To the residue was added 1.904 g (7.80 mmol) 2-methylthio-4,5-dihydroimidazole hydroiodide and 100 mL pyridine. The mixture was set at reflux under nitrogen for 18 h. The mixture was allowed to cool to room temperature and the residue flash column chromatographed (1:4 methanol - chloroform) to provide 0.48 g (1.95 mmol, 25 %) of a gum; NMR(CDCl₃): 7.90 (bs, 1H), 7.33 (bs, 1H), 4.90 (m, 1H), 1.63-3.80 (m, 14H), 1.47 (s, 9H); Mass spectrum: m/z 311 (free base + H).

F. 3-[4-[(N-imidazolin-2-yl)amino]butyl]-(5 R,S)-isoxazolin-5-ylcarboxylic acid, trifluoroacetate: A mixture of 480 mg (1.95 mmol) of the product obtained from Ex. 56, Part E, 15 mL methylene chloride and 1.0 mL (excess) trifluoroacetic acid was stirred for 18 h at room temperature under nitrogen. Solvent was removed and toluene was added. Solvent was removed to provide 240 mg (0.629 mmol, 32 %) of a gum; NMR(d₆-DMSO): 8.27 (m, 1H), 7.20 (m, 1H), 4.90 (m, 1H), 1.40-3.70 (m, 14H); Mass spectrum: m/z 255 (M + H).

G. tert-Butyl 2-benzyloxycarbonylamino-3-[3-[4-[(N-imidazolin-2-yl)amino]butyl]-(5 R,S)-isoxazolin-5-yl]carbonylaminopropionate: A mixture of 230 mg (0.603 mmol) of the product obtained from Ex. 56, Part F, 217.8 mg (0.740 mmol) (R)-t-butyl-3-amino-2-benzyloxycarbonylaminopropionate, 180 mg (0.930 mmol) of 1-ethyl-3-(3-dimethylaminopropyl)carbodiimide and 26 mg (catalytic) 1-hydroxybenzotriazole hydrate was stirred at room temperature under nitrogen. Added was 10 mL N,N-dimethylformamide followed by 170 mg (1.67 mmol) triethylamine and the mixture stirred 18 h at room temperature under nitrogen. Solvent was removed and the

residue flash column chromatographed (1:4 methanol/chloroform) to provide 217 mg (0.329 mmol, 54%) of a gum; NMR(CDCl₃/TMS): 8.36 (bs, 1H), 7.68 (bs, 1H), 7.58 (bs, 1H), 7.34 (s, 5H), 6.01 (t, 1H), 5.10 (s, 2H), 4.87 (m, 1H), 1.50-4.38 (m, 17H), 1.41 (s, 9H); Mass spectrum: m/z 531 (free base + H).

H. 2-benzyloxycarbonylamino-3-[3-[4-[(N-imidazolin-2-yl)amino]butyl]-(5 R,S)-isoxazolin-5-yl]carbonylaminopropionic acid, trifluoroacetate: A mixture of 217 mg (0.329 mmol) of the product obtained from Ex. 56, Step H, 50 mL methylene chloride and 50 mL of 0.2 M NaOH was placed in a separatory funnel, shaken, and the layers separated. The organic layer was washed two more times with 50 mL portions of 0.2 M NaOH. The organic layer was dried over anhydrous magnesium sulfate, filtered and solvent was removed. To the residue was added 10 mL methylene chloride and 0.5 mL (excess) trifluoroacetic acid and the mixture stirred 18 h at room temperature under nitrogen. Solvent was removed and toluene was added. Solvent was removed and the residue triturated under hexanes. The resulting solid was filtered to dryness to provide 127 mg (0.215 mmol, 65%) of the title compound as an off-white solid, mp = 100-6° C; NMR(d₆-DMSO): 7.21-8.35 (m, 10H), 1.50-5.12 (m, 20H); Mass spectrum: m/z 475 (M + H).

Example 83

2(S)-Benzyloxycarbonylamino-3-[3-(4-(N-[3,4,5,6-tetrahydropyrimidin-2-yl]amino)butyl)isoxazolin-5-(R,S)-ylcarbonyl]aminopropionic acid.

The title compound was prepared in an analogous manner to the compound of Example 56 by substitution of 2-methylthio-3,4,5,6-tetrahydropyrimidine hydroiodide for 2-methylthio-4,5-dihydroimidazole hydroiodide in Ex. 56, Part E. mp 101-108° C.

Example 110

2(S)-Benzyloxycarbonylamino-3-[3-(3-(N-[3,4,5,6-tetrahydropyrimidin-2-yl]amino)propyl)isoxazolin-5-(R,S)-ylcarbonyl]aminopropionic acid.

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A. 4-Phthalimidobutyraldehyde oxime: A solution of 4-phthalimidobutyraldehyde (R. Hamilton et al., Tetrahedron Letters, 1993, 34, 2847) (17.38 g, 80 mmol) in pyridine (150 mL) was treated with hydroxylamine hydrochloride (6.67 g, 96 mmol) and stirred at room temperature for 17 h. After concentration, the residue was triturated in water, stirred for 3 h, and filtered to provide the title product as a light tan solid (14.15 g, 76%): NMR (CDCl₃) δ 8.06 (b, 1H), 7.85 (m, 2H), 7.70 (m, 2H), 7.46 (t, 0.15H), 6.76 (t, 0.85H), 3.73 (t, 2H), 2.44 (m, 1.7H), 2.28 (m, 0.3H), 1.90 (m, 2H); mass spec (NH₃-CI) m/z 233 (M+H⁺, 100%).

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B. tert-Butyl 3-(3-[3-phthalimidopropyl]-isoxazolin-5-(R,S)-yl)-carboxylate: A mixture of the product of Ex. 110, Part A (2.10 g, 9.05 mmol), N-chlorosuccinimide (1.21 g, 9.05 mmol), pyridine (2 drops), t-butyl acrylate (2.7 mL, 18.10 mmol), and triethylamine (1.5 mL, 10.86 mmol) in 30 mL chloroform was reacted according to the procedure of Ex. 284, Part D to provide the title product (2.40 g, 74%): NMR (CDCl₃) δ 7.84 (m, 2H), 7.78 (m, 2H), 4.82 (m, 1H), 3.78 (t, 2H), 3.20 (m, 2H), 2.41 (t, 2H), 2.02 (m, 2H), 1.44 (s, 9H); mass spec (NH₃-CI) m/z 376 (M+NH₄⁺, 100%).

C. 3-(3-[3-phthalimidopropyl]isoxazolin-5-(R,S)-yl)-carboxylic acid: The product of Ex. 110 step B (500 mg, 1.40 mmol) was reacted with trifluoroacetic acid (5 mL) in 10mL methylene chloride according to the procedure of Ex. 284, Part E to provide 420 mg (100%) of the title

product as a foamy solid: NMR (DMSO-d₆) δ 7.81 (m, 2H), 7.78 (m, 2H), 5.40 (b, 1H), 5.02 (m, 1H), 3.79 (t, 2H), 3.30 (m, 2H), 2.42 (t, 2H), 2.00 (q, 2H).

- 5 D. tert-Butyl N²-benzyloxycarbonyl-N³-[3-[3-(3-phthalimidopropyl)isoxazolin-5-(R,S)-yl]carbonyl]-2-(S)-2,3-diaminopropionate: The product of Ex. 110, Part C (420 mg, 1.40 mmol) was reacted with t-butyl N²-benzyloxycarbonyl-2-(S)-2,3-diaminopropionate (412 mg, 1.40 mmol), O-(1H-benzotriazol-1-yl)-N,N,N',N'-tetramethyluronium tetrafluoroborate (450 mg, 1.40 mmol), triethylamine (0.6 mL, 4.20 mmol) in 25 mL ethyl acetate according to the procedure of Ex. 284, Part F to provide 595 mg (66%) of the title product: NMR (CDCl₃) δ 7.81
- 10 (m, 2H), 7.70 (m, 2H), 7.34 (s, 5H), 7.04 (b, 1H), 5.06 (s, 2H), 4.90 (m, 1H), 4.38 (m, 1H), 3.70 (m, 4H), 3.20 (m, 3H), 2.39 (bt, 2H), 1.98 (m, 2H), 1.40 (s, 9H); mass spec (ESI) m/z 579.4 (M+H⁺, 100%).
- 20 E. tert-Butyl N²-benzyloxycarbonyl-N³-[3-[3-(3-aminopropyl)isoxazolin-5-(R,S)-yl]carbonyl]-2-(S)-2,3-diaminopropionate: The product of Ex. 110 step D (550 mg, 0.99 mmol) was reacted with hydrazine (0.1 mL, 2.50 mmol) in 5 mL ethanol according to the procedure of Ex.
- 25 284 Part G to provide 223 mg (50%) of the title product: NMR (CDCl₃) δ 7.38 (m, 5H), 7.04 (b, 1H), 5.80 (dd, 1H), 5.10 (s, 2H), 4.90 (m, 1H), 4.38 (m, 1H), 3.64 (m, 2H), 3.40-3.12 (m, 2H), 2.76 (m, 2H), 2.40 (m, 2H), 1.72 (m, 2H), 1.50 (s, 9H), 1.46 (b, 2H); mass spec (ESI) m/z
- 30 449.5 (M+H⁺, 100%).

- F. tert-Butyl N²-benzyloxycarbonyl-N³-[3-(3-(N-[3,4,5,6-tetrahydropyrimidine-2-yl]amino)propyl)-isoxazolin-5-(R,S)-ylcarbonyl]-(S)-2,3-diaminopropionate: The product of Ex. 110, step E (124 mg, 0.276 mmol) was reacted with 2-methylthio-3,4,5,6-
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- tetrahydropyrimidine hydroiodide (86.0 mg, 0.332 mmol) in 2 mL pyridine according to the procedure of Ex. 284 Part H to provide 30 mg (25%) of the title product: NMR (CDCl₃) δ 7.80 (b, 1H), 7.38 (m, 5H), 7.18 (b, 2H),
- 5 5.82-5.78 (2b, 1H), 5.10 (s, 2H), 4.90 (m, 1H), 4.38 (b, 2H), 3.80 (b, 2H), 3.58-3.10 (m, 9H), 2.42 (b, 2H), 1.95 (b, 2H), 1.42 (s, 9H); mass spec (ESI) m/z 531.4 (M+H⁺, 100%).
- 10 G. N²-benzyloxycarbonyl-N³- [3-(3-(N-[3,4,5,6-tetrahydropyrimidine-2-yl]amino)propyl)-isoxazolin-5-(R,S)-ylcarbonyl]-(S)- 2,3-diaminopropionic acid: The product of part F (30mg, 0.051 mmol) was dissolved in methylene chloride (5 mL) and treated with 0.2 mL
- 15 trifluoroacetic acid according to the procedure of Ex. 284, Part I, to provide the title product (25 mg, 90%) as a glassy foam: NMR (DMSO-d₆) δ 8.36 (s, 1H), 8.20 (m, 1H), 7.60 (m, 2H), 7.38 (bs, 5H), 7.28 (m, 1H), 5.08 (s, 2H), 4.88 (m, 1H), 4.36 (b, 2H), 3.76 (b, 2H), 3.48-3.08
- 20 (9H), 2.30 (b, 2H), 1.82 (b, 2H); mass spec (ESI) m/z 475.3 (M+H⁺, 100%).

Example 284

- 2(S)-benzyloxycarbonylamino-3-[2-[3-(2-(N-imidazolin-2-yl)- aminoethyl)isoxazolin-5-(R,S)-yl]ethylcarbonylamino]propionic acid.
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- A. 2-(2-Pthalimidoethyl)-1,3-dioxolane: To a solution of potassium phthalimide (15.20 g, 82.0 mmol) dissolved
- 30 in 150 mL dimethylformamide was added 2-(2-Bromoethyl)-1,3- dioxolane (14.86 g, 82.0 mmol). After stirring at room temperature for 22 h, the mixture was diluted with excess water and stirred. The resulting white precipitate was collected and dried (17.0 g, 84%): NMR
- 35 (CDCl₃) δ 7.84 (m, 2H), 7.72 (m, 2H), 4.98 (t, 1H), 3.99

(m, 2H), 3.86 (m, 4H), 2.10 (m, 2H); mass spec (NH₃-CI)
m/z 248.1 (M+H⁺, 100%).

B. 3-Phthalimidopropionaldehyde: The product of Ex.

- 5 284, part A (17.0 g, 69.0 mmol) was dissolved in dioxane (150 mL) and treated with 1:1 1N HCl/water (200 mL). After stirring at room temperature overnight, the mixture was heated to reflux for 3 h. The reaction was concentrated, neutralized with aqueous NaHCO₃, extracted
10 into chloroform, and dried (Na₂SO₄). Concentration of the solvent provided the title product (14.0 g, 100%): NMR (CDCl₃) δ 7.82 (m, 2H), 7.78 (m, 2H), 4.02 (t, 2H), 2.88 (t, 2H).

15 C. 3-Phthalimidopropionaldehyde oxime: The product of

- Ex. 284, part B (14.0 g, 69.0 mmol) was reacted with hydroxylamine hydrochloride (5.80 g, 83.0 mmol) in pyridine (200 mL). After stirring overnight, the pyridine was evaporated and the resultant mixture
20 diluted with water. The precipitate was collected and dried providing the title product as a white solid (8.00 g, 53%): NMR (CDCl₃) δ 7.82 (m, 2H), 7.76 (m, 2H), 6.82 (t, 1H), 3.90 (m 4H).

25 D. tert-Butyl 3-(3-[2-phthalimidoethyl]-isoxazolin-5-

- (R,S)-yl)-propionate: The product of Ex. 284, part C (2.69 g, 12.35 mmol) was combined with N-chlorosuccinimide (1.65 g, 12.35 mmol) and pyridine (2 drops) in chloroform (30 mL). After stirring at room
30 temperature for 1 h, t-butyl pentenoate (3.86 g, 24.7 mmol) and triethylamine (2.1 mL, 14.82 mmol) were added and stirring continued at room temperature. After 18 h, the resulting mixture was concentrated and flash chromatographed (7:3 hexane/ethyl acetate) to provide
35 2.50 g (54%) of the title product: NMR (CDCl₃) δ 7.82 (m, 2H), 7.78 (m, 2H), 4.60 (m, 1H), 3.96 (t, 2H), 3.18

(dd, 1H) 2.72 (m, 3H), 2.38 (dt, 2H), 1.84 (q, 2H), 1.42 (s, 9H); mass spec (NH₃-CI) m/z 373.3 (M+H⁺, 100%).

E. 3-(3-[2-Phthalimidoethyl]-isoxazolin-5-(R,S)-yl)-

5 propionic acid: The product of Ex. 284, part D (500mg, 1.34 mmol) was dissolved in 10 mL of methylene chloride and 5 mL trifluoroacetic acid. After 4 h the solution was concentrated to provide the title product as a foamy solid (420 mg, 100%): NMR (DMSO-d₆) δ 7.82 (m, 2H), 7.76
10 (m, 2H), 4.62 (m, 1H), 3.96 (t, 2H), 3.20 (m, 1H), 2.78 (m, 3H), 2.56 (m, 2H), 1.96 (q, 2H).

F. tert-Butyl 2(S)-benzyloxycarbonylamino-3-[2-[3-(2-phthalimidoethyl)isoxazolin-5-(R,S)-

15 yl]ethylcarbonylamino]-propionate: The product of Ex. 284, part E (420 mg, 1.33 mmol) was combined with t-butyl N²-benzyloxycarbonyl-2-(S)-2,3-diaminopropionate (M. Mokotoff and L. Logue, J. Med. Chem., 1981, 24, 554) (390 mg, 1.33 mmol), O-(1H-benzotriazol-1-yl)-N,N,N',N'-
20 tetramethyluronium tetrafluoroborate (430 mg, 1.33 mmol), and triethylamine (0.6 mL, 4.00 mmol) in 25 mL of ethyl acetate. After stirring at room temperature for 20h, the reaction was concentrated and flash chromatographed (ethyl acetate) to provide 647 mg (86%) of the title
25 product: NMR (CDCl₃) δ 7.82 (m, 2H), 7.72 (m, 2H), 7.36 (bs, 5H), 6.06 (b, 1H), 5.80 (b, 1H), 5.08 (bd, 2H), 4.60 (b, 1H), 4.37 (b, 1H), 3.97 (bt, 1H), 3.62 (m, 1H), 3.07 (m, 1H), 2.70 (b, 3H), 2.24 (b, 1H), 1.97 (m, 1H), 1.44 (s, 9H); mass spec (ESI) m/z 593.4 (M+H⁺, 100%).

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G. tert-Butyl 2(S)-benzyloxycarbonylamino-3-[2-[3-(2-aminoethyl)isoxazolin-5-(R,S)-

yl]ethylcarbonylamino]-propionate: The product of Ex. 284, part F (450 mg, 0.76 mmol) was treated with
35 hydrazine (0.1 mL, 1.90 mmol) in 7 mL of ethanol and stirred at room temperature overnight. The mixture was

concentrated and taken up in water, the pH was adjusted to 11 and the resultant extracted with methylene chloride. The organic layer was dried (Na₂SO₄), filtered, and concentrated providing 250 mg (71%) of the title product as a gummy solid: NMR (CDCl₃) δ 7.40 (m, 5H), 6.20 (b, 1H), 5.85 (b, 1H), 5.10 (s, 2H), 4.60 (b, 1H), 4.30 (b, 1H), 3.60 (bt, 2H), 3.00-2.96 (m, 3H), 2.60 (2dd, 1H), 2.42 (b, 2H), 2.30 (b, 2H), 2.00-1.80 (m, 2H), 1.58 (bs, 2H), 1.42 (s, 9H); mass spec (ESI) m/z 463.3 (M+H⁺, 100%).

H. tert-Butyl 2(S)-benzyloxycarbonylamino-3-[2-[3-(2-(N-imidazolin-2-ylamino)ethyl)isoxazolin-5-(R,S)-yl]ethylcarbonylamino]propionate: The product of Ex, 284, part G (132 mg, 0.290 mmol) was reacted with 2-methylthio-2-imidazoline hydroiodide (84 mg, 0.342 mmol) in 5 mL pyridine over an oil bath heated at 120 C°. After 18 h the mixture was cooled and concentrated providing the title product (102 mg, 66%): NMR (CDCl₃) δ 8.08 (b, 1H), 7.60 (b, 1H), 7.39 (bs, 5H), 7.20 (b, 1H), 6.18 (b, 1H), 5.82 (b, 1H), 5.10 (s, 2H), 4.62 (b, 1H), 4.30 (b, 1H), 3.61 (bs, 2H), 3.58 (m, 2H), 3.02-2.94 (m, 3H), 2.60 (m, 1H), 2.40 (b, 2H), 2.30 (b, 2H), 1.94 (m, 2H), 1.40 (s, 9H); mass spec (ESI) m/z 531.5 (M+H⁺, 100%).

I. 2(S)-benzyloxycarbonylamino-3-[2-[3-(2-(N-imidazolin-2-yl)-aminoethyl)isoxazolin-5-(R,S)-yl]ethylcarbonylamino]propionic acid: The product of Ex. 284, part H (100 mg, 0.188 mmol) was dissolved in 2 mL of methylene chloride and 0.2 mL trifluoroacetic acid. After 5 h, the solution was concentrated and triturated with ether to provide 70.0 mg (64%) of the title product: NMR (DMSO-d₆) δ 8.20 (m, 1H), 8.04 (m, 1H), 7.53 (bd, 1H), 7.40 (bs, 5H), 5.04 (s, 2H), 4.42 (m, 1H), 4.08 (m, 1H), 3.52-3.20 (m, 10H), 3.02 (m, 2H),

2.60 (m, 1H), 2.12 (m, 2H), 1.70 (m, 2H); mass spec (ESI) m/z 475.3 ($M+H^+$, 100%).

General Procedure for synthesis of 1-(9-fluorenylmethoxycarbonylamino)alkenes:

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- A. 1-(p-Toluensulfonyloxy)-3-butene: 3-Butene-1-ol (10.5 g, 0.146 mol) was dissolved in 75 mL of pyridine and cooled in an ice bath. p-Toluenesulfonyl chloride (28.5 g, 0.150 mol) was added slowly. The solution was stirred for 8 h in an ice bath then allowed to stir at room temperature overnight. The solution was poured into saturated NaHCO_3 and ice. After the ice melted the mixture was extracted with dichloromethane and the organic layer evaporated to provide the title compound (28.6 g, 86%). ^1H NMR (CDCl_3): δ 2.32-2.44 (m, 2H), 2.45 (s, 3H), 4.05 (t, $J=10$ Hz, 2H), 5.02-5.12 (m, 2H), 5.60-5.74 (m, 1H), 7.35 (d, $J=8$ Hz, 2H), 7.78 (d, $J=8$ Hz, 2H). mass spectrum m/z 311 ($M+\text{NH}_4$, base peak), 294 ($M+H$).
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- B. 1-amino-3-butene: The product of Ex. 637, part A (28.6g, 0.126mol) was dissolved in 25 mL of dimethylformamide. Sodium azide (23.5g, 0.354mol) was added in several portions and the reaction mixture allowed to stir at room temperature overnight. The reaction mixture was poured into 100 mL of water and 200 mL of diethyl ether and the layers separated. The organic layer was washed with 100 mL of water and 100 mL of brine and dried over magnesium sulfate. The crude azide solution was reacted without further purification. Triphenylphosphine (34.0 g, 0.129 mol) was added and the reaction mixture stirred for 6h at room temperature. 2.3 mL of water was added to the reaction and the solution was stirred overnight. The diethyl ether layer was distilled and 4.62g (52%) of the title compound was
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obtained. ^1H NMR (CDCl_3): δ 1.60 (br s, 2H), 2.20 (q, J = 9 Hz, 2H), 2.78 (t, J = 9 Hz, 2H), 5.05-5.15 (m, 2H), 5.70-5.84 (m, 1H).

- 5 C. 1-(9-Fluorenylmethoxycarbonylamino)-3-butene: The product of Ex. 637, part B (5.11 g, 65 mmol) was dissolved in 50 mL of tetrahydrofuran and 50 mL of 10% NaHCO_3 and cooled in an ice bath. 9-Fluorenylmethoxycarbonyl chloride (16.8 g, 65 mmol) was added in several portions, after 4h the ice bath was removed and the reaction mixture allowed to stir at room temperature overnight. The reaction mixture was poured into 200 ml of water and extracted with diethyl ether. The combined organic layers were evaporated to leave a white solid which was purified by flash column chromatography (hexane:ethyl acetate 3:1) to yield 5.4 g (28%) of the desired product. ^1H NMR (CDCl_3) δ 2.22-2.36 (m, 2H), 3.22-3.34 (m, 2H), 4.24 (t, J = 8 Hz, 1H), 4.40 (d, J = 8 Hz, 1H), 4.60 (br s, 1H), 5.06-5.16 (m, 2H), 5.72-5.84 (m, 1H), 7.26-7.44 (m, 4H), 7.58 (d, J = 9 Hz, 2H), 7.78 (d, J = 9 Hz, 2H). Mass spectrum: m/z 311 (M^+ NH_4 , base peak), 294, (M^+), HRMS Calcd 294.1494 observed 294.1505.

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Example 583

2(S)-Benzyloxycarbonylamino-3-[5-(4-(N-[imidazolin-2-yl]amino)butyl)isoxazolin-3-(R,S)-ylcarbonyl]aminopropionic acid.

- 30 A. 1-(9-Fluorenylmethoxycarbonylamino)-5-hexene: The title alkene was prepared in 36% yield according to the method described in the above general procedure, except starting with 5-hexene-1-ol. ^1H NMR (CDCl_3) δ 1.34-1.58 (m, 4H), 2.02-2.14 (m, 2H), 3.12-3.24 (m, 2H), 4.20 (t, J = 8 Hz, 1H), 4.40 (d, J = 8 Hz, 2H), 4.72 (s, 1H),
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4.90-5.04 (m, 2H), 5.70-5.84 (m, 1H), 7.26-7.42 (m, 4H),
7.58 (d, J = 9 Hz, 2H), 7.76 (d, J = 9 Hz, 2H).

B. 3-Methoxycarbonyl-5-[(9-

- 5 fluorenylmethoxycarbonylamino)butyl]- Δ^2 -isoxazoline: 1-
(9-Fluorenylmethoxycarbonylamino)-5-hexene (2.00 g, 6.22
mmol) and phenylisocyanate (3.70 g, 31.11 mmol) was
dissolved in 40 mL of benzene. Thirty drops of
diisopropylethylamine was added followed by methyl
10 nitroacetate (1.48 g, 12.44 mmol) and stirred at room
temperature for 48h. The reaction mixture was filtered
and the filtrate evaporated. The residue was purified by
flash column chromatography (hexane:ethyl acetate 3:1 to
1:1) to yield 1.83 g (70%) of a tan solid. ^1H NMR
15 (CDCl_3) δ 1.32-1.84 (m, 6H), 2.78-2.90 (m, 1H), 3.12-
3.34 (m, 3H), 3.86 (s, 3H), 4.20 (t, J = 7 Hz, 1H), 4.40
(d, J = 7 Hz, 2H), 4.72-4.86 (m, 2H), 7.26-7.42 (m, 4H),
7.58 (d, J = 9 Hz, 2H), 7.80 (d, J = 9 Hz, 2H). mass
spectrum m/z 440 (M+NH₄), 423 (M+H), 244 (base peak).

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C. 3-Carboxy-5-[(9-

- fluorenylmethoxycarbonylamino)butyl]- Δ^2 -isoxazoline:
The product of Ex. 583, Part B (1.83 g, 4.33 mmol) was
dissolved in 50 mL of tetrahydrofuran and 25 mL of water
25 and cooled in an ice bath. Lithium hydroxide (174 mg,
4.15 mmol) was dissolved in 2 mL of water and added to
the tetrahydrofuran/water solution. After approximately
10min the reaction mixture was quenched with 10% HCl, to
pH=3. The mixture was extracted with diethyl ether,
30 dried over magnesium sulfate and evaporated to a syrup.
Trituration with benzene:pentane 3:1 and filtration
afforded a yellow solid which was recrystallized from
benzene chloroform 5:1 to yield 1.18g (67%) of the title
compound as a white powder. ^1H NMR (CDCl_3) δ 1.34-1.82
35 (m, 6H), 2.80-2.98 (m, 1H), 3.10-3.32 (m, 3H), 4.16-4.30
(m, 1H), 4.40-4.52 (m, 2H), 4.80-4.90 (m, 2H), 6.50 (br

s, 1H), 7.26-7.42 (m, 4H), 7.58 (d, J = 9 Hz, 2H), 7.76 (d, J = 9 Hz, 2H). Mass spectrum m/z 426 (M+NH₄) 382 (M+NH₄-CO₂, base peak) HRMS calcd 409.1763 observed 409.1748.

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D. 3-tert-Butyloxycarbonyl-5-[4-(9-fluorenylmethoxycarbonylamino)butyl]- Δ^2 -isoxazoline

The compound of Ex. 583, Part C (715 mg, 1.75 mmol) was dissolved in 2 mL of dichloromethane and cooled in an ice bath. 2 mL of ca. 3.5M solution of N,N'-diisopropyl-O-t-butyl isourea was added and the reaction mixture stirred for 8h, and the ice bath removed, and stirred overnight at room temperature. The reaction mixture was cooled in an ice bath and 2 mL of glacial acetic acid was added dropwise, during which time vigorous gas evolution occurred. The reaction mixture was diluted with ice water and cautiously neutralized with saturated Na₂CO₃, and extracted three times with ethyl acetate. The organic layer was dried over MgSO₄, filtered and evaporated. The residue was taken up in 20 mL of 1:1 dichloromethane/ ethyl acetate and filtered. the filtrate was evaporated and purified by flash column chromatography, CH₂Cl₂:hexane:ethyl acetate, 2:2:1 to yield 375 mg (46%) of the title compound. ¹H NMR (CDCl₃) δ 1.35-1.78 (m, 15H), 2.80, (dd, J = 16, 8 Hz, 1H), 3.15-3.30 (m, 3H), 4.22 (t, J = 7Hz, 1H), 4.40 (d, J = 7 Hz, 2H), 4.70-4.80 (m, 2H), 7.28-7.44 (m, 4H), 7.60 (d, J = 9 Hz, 2H), 7.78 (d, J = 9 Hz, 2H). Mass spectrum m/z 482, (M + NH₄), 465, (M+).

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E. 3-tert-Butyloxycarbonyl-5-(4-aminobutyl)- Δ^2 -isoxazoline

The compound of Ex. 583, Part D (375 mg, 0.81 mmol) was dissolved in 20 mL of dichloromethane, 0.5 mL of piperidine was added and the reaction mixture stirred overnight at room temperature. The solvent was

evaporated and the residue purified by flash column chromatography CH₂Cl₂: isopropanol 2% to CH₂Cl₂: isopropanol 2%: triethylamine: 0.5% to yield 163 mg (83%) of the title compound. ¹H NMR (CDCl₃) δ 1.35-

- 5 1.80 (m, 15 H), 2.40 (br s, 2H), 2.70-2.86 (m, 3H), 3.22 (dd, J = 16, 8 Hz, 1H), 4.80 (m, 1H). Mass spectrum m/z 243 (M+ H, base peak).

10 F. 3-tert-Butyloxycarbonyl-5-[4-(imidazolin-2-ylamino)butyl]-Δ²-isoxazoline hydroiodide

The compound of Ex. 583, Part E (163 mg, 0.67 mmol) and 2-methylthioimidazoline (180 mg, 0.73 mmol) was dissolved in pyridine and gently refluxed overnight. The solvent was evaporated and the residue purified by

- 15 preparatory TLC, chloroform, 20% methanol, to yield 100mg (33%) of the title compound. ¹H NMR (CDCl₃) δ 1.35-1.80 (m, 15H), 2.84 (dd, J = 16 Hz, 8 Hz, 1H), 3.20-3.32 (m, 3H), 2.56 (br s, 3H), 3.74 (s, 4H), 4.82 (m, 1H). Mass spectrum m/z 311 (M (-HI) + H).

20

G. tert-Butyl-2-benzyloxycarbonylamino-3-[5-[4-[(N-imidazolin-2-yl)amino]butyl-5(R,S)-isoxazolin-3-yl]carbonylamino]propionate:

- The compound of Ex. 583, Part F (100 mg, 0.23 mmol) was suspended in 2 mL of dichloromethane and 2 mL of trifluoroacetic acid was added. The reaction mixture was stirred for 1 h. at room temperature and the solvent evaporated to give the brown oil to which was dissolved in 1 mL of DMF. t-Butyl 3-amino-2-S-(benzyloxycarbonylamino) propionate (67 mg, 0.23 mmol) was added followed by benzotriazol-1-yloxy-tris(dimethylamino)phosphonium hexafluorophosphate (110 mg, 0.24 mmol) and diisopropylethyl amine (65 mg, 0.50 mmol) and stirred at room temperature overnight. The solvent was evaporated under reduced pressure and
- 35 the residue purified by preparatory TLC, chloroform, 20% methanol to yield 42mg, (28%) of the title compound. ¹H

NMR (CDCl₃) δ 1.35-1.80 (m, 15H), 2.80-3.20 (m, 4H), 3.70 (s, 4H), 4.24 (t, J = 5 Hz, 1H), 4.36 (t, J = 5 Hz, 1H), 4.78 (m, 1H), 5.10 (s, 2H), 7.35 (s, 5H).

- 5 H. 2(S)-benzyloxycarbonylamino-3-[5-(4-(N-[imidazolin-2-yl]amino)butyl)isoxazolin-3-(R,S)-ylcarbonyl]aminopropionic acid: The product from Ex. 583, Part G was suspended in 2 ml of dichloromethane and 1 mL of trifluoroacetic acid was added. the reaction
 10 mixture was stirred at room temperature for 1 h. The solvent was evaporated and the residue triturated with diethyl ether to provide the title compound. ¹H NMR (CDCl₃) δ 1.32-1.76 (m, 6H), 2.80-2.90 (m, 1H), 3.16-3.80 (m, 6H), 4.40-4.52 (m, 2H), 4.70-4.82 (m, 1H), 5.04-5.16
 15 (m, 1H), 7.24-7.42 (m, 5H). mass spectrum m/z 475.4

Example 637

- 2(S)-Benzyloxycarbonylamino-3-[5-(3-(N-[imidazolin-2-yl]amino)propyl)isoxazolin-3-(R,S)-ylcarbonyl]aminopropionic acid.
 20

- A. 1-(9-Fluorenylmethoxycarbonylamino)-4-pentene: The title alkene was prepared in 49% yield according to the methods described in the above general procedure, except
 25 starting with 4-pentene-1-ol. ¹H NMR(CDCl₃) δ 1.58-1.70 (m, 2H), 2.02-2.16 (m, 2H), 4.22 (t, J = 8 Hz, 1H), 4.42 (d, 8 Hz, 2H), 4.75 (br s, 1H), 4.94-5.08 (m, 2H), 5.72-5.84 (m, 1H), 7.26-7.42 (m, 4H), 7.58 (d, J = 9 Hz, 2H), 7.78 (d, J = 9 Hz, 2H). Mass spectrum m/z 325 (M=NH₄,
 30 base peak) 308, (M+H). HRMS calcd 308.1650, observed 308.1650.

- B. 3-Carboxy-5-[(9-fluorenylmethoxycarbonylamino)propyl]-Δ²-isoxazoline:
 35 The title compound was prepared according to Ex. 583, Part B-C in 58% overall yield starting with 1-(9-

Fluorenylmethoxy-carbonylamino)-4-pentene and methyl
nitroacetate. ^1H NMR (DMSO) δ 1.30-1.62 (m, 4H), 2.78
(dd $J = 16, 8$ Hz, 1H), 2.98 (d, $J = 7$ Hz, 2H), 3.20 (dd,
 $J = 16, 8$ Hz, 1H), 4.20 (t, $J = 7$ Hz, 1H), 4.30 (d, $J =$
5 7 Hz, 2H), 4.68-4.80 (m, 1H, 7.26-7.44, m, 4H), 7.64 (d,
 $J = 9$ Hz, 2H), 7.84 (d, $J = 9$ Hz, 2H). 13.40 (br s, 1H).
Mass spectrum m/z 395 ($M+H$), HRMS calcd 395.1606
observed 395.1591.

10

Example 667

2-(S)-Benzyloxycarbonylamino-3-[5-(R,S)-(4-(N-(pyridin-
2-yl)amino)butyl)isoxazolin-3-ylcarbonyl]aminopropionic
acid hydrochloride salt

- 15 A. 3-Ethoxycarbonyl-5-[-4-(hydroxy)butyl]isoxazoline:
5-Hexene-1-ol (5.0g, 0.05M) was dissolved in 30 mL of
tetrahydrofuran, an aqueous solution of NaHCO_3 (29.4g,
0.35M in 20 mL water) was added and the reaction mixture
cooled in an ice bath. Ethyl chlorooximinoacetate (11.4
20 g, 0.075M) was added over 15 min. in several portions.
The reaction mixture was stirred in an ice bath for 6h.
An additional amount of ethyl chlorooximinoacetate (7.75g,
0.05M) was added and the reaction mixture was
allowed to stir overnight, during which time the ice
25 bath melted. The reaction mixture was partitioned
between ethyl acetate and water and the organic layer
was separated, dried over magnesium sulfate, filtered
and evaporated. The crude product was purified by flash
column chromatography (hexane / ethyl acetate 3:1) to
30 yield the title compound as a colorless oil (9.22g,
86%). ^1H NMR (CDCl_3): δ 1.3 (t, $J = 7$ Hz, 3H), 1.40-
1.90 (m, 6H) 2.80-2.94 (m, 1H, 3.20-3.54, m, 1H), 3.66
(br s, 2H, 4.34, q, $J = 7$ Hz, 2H), 4.78-4.90 (m, 1H).
mass spectrum m/z 233, ($M+\text{NH}_4$, base peak), 216, ($M+$)
35 Alternatively the title compound can be prepared by the
following procedure.

5-Hexene-1-ol (5 g, 0.05 M) and diethyl nitromalonate (15.4 g, 0.075 M) was dissolved in mesitylene (50 mL) and refluxed for 5h. The solvent was removed in vacuo, and the residue purified by flash column chromatography on silica gel (hexane / ethyl acetate 1:1) to provide the title product (5.11g, 47.5%).

B. 3-Ethoxycarbonyl-5-[-4-oxobutyl]isoxazoline:

Oxalyl chloride (7.30g, 0.0575M) was dissolved in anhydrous methylene chloride and cooled to -60°C in a dry-ice/CHCl₃ bath. Dimethylsulfoxide (9.38g, 0.12M) was dissolved in anhydrous methylene chloride and added dropwise over 30 min. to the solution of oxalyl chloride, and allowed to stir for an additional 30 min. The product of Ex.667, part A. (10.75 g, 0.05M) was dissolved in anhydrous methylene chloride (30 mL) and added to the reaction mixture dropwise over 45 min, and allowed to stir for an additional 30 min. Triethylamine (25.25g, 0.25M) was added dropwise over 15 min. The ice bath was removed and the reaction mixture allowed to warm to room temperature. The reaction mixture was diluted with methylene chloride (100 mL) and washed with water, 1N HCl, water, and brine. The organic layer was separated and dried over magnesium sulfate and evaporated to yield the title compound as a colorless oil (9.54g, 90%). ¹H NMR (CDCl₃): δ 1.37 (t, J = 7 Hz, 3H), 1.60, 1.92 (m, 6H), 2.52 (t J = 6 Hz, 2H), 2.80-2.92 (m, 1H, 3.22-3.36, m, 1H), 4.36 (q, J = 7 Hz, 2H), 4.74-4.88 (m, 1H, 9.58, s, 1H).

C. 3-Ethoxycarbonyl-5-[4-(-N-(pyridin-2-yl)amino)butyl]isoxazoline:

The product of Ex.667 part B. (9.40g, 0.044M) was dissolved in dichloroethane (100 mL) and cooled in an ice bath. 2-Aminopyridine (4.57g, 0.048M) was added followed by the addition of sodium triacetoxyborohydride

(14.0g, 0.066M). The ice bath was removed and the reaction mixture allowed to stir at room temperature for 4h. The reaction mixture was cautiously poured into a saturated solution of sodium bicarbonate (200 mL),
5 and extracted with ethyl acetate. The organic layer was dried over anhydrous sodium carbonate, filtered and evaporated to yield a semisolid. The crude product was triturated with a mixture of ether and hexane, and the product collected by filtration (8.93g, 70%) ¹H NMR
10 (CDCl₃): δ 1.30 (t, J = 7 Hz, 3H), 1.40-1.90 (m, 6H, 2.80-2.92, m, 1H), 3.20-3.34 (m, 2H), 4.34 (q, J = 7 Hz, 2H), 4.70-4.90 (m, 2H), 6.30 (d, J = 9 Hz, 1H), 6.48 (t, J = 6 Hz, 1H), 7.42 (t J = 6 Hz, 1H), 8.04 (d, J = 4 Hz, 1H).

15

D. 3-Ethoxycarbonyl-5-[4-(N-(pyridin-2-yl)-N-(tert-butylloxycarbonyl)amino)butyl]isoxazoline:

The product of Ex. 667 part C. (8.93g, 0.031M) was dissolved in methylene chloride. 4-Dimethylaminopyridine
20 (374mg, 0.003M) was added followed by di-tert-butyl dicarbonate (14.73g, 0.067M). The reaction mixture was allowed to stir at room temperature overnight. The mixture was diluted with water and the organic layer separated, dried over magnesium sulfate, filtered and
25 evaporated. The crude product was purified by flash column chromatography (hexane/ ethylacetate, 3:1) to yield the title product (9.7g, 81%). ¹H NMR (CDCl₃): δ 1.38 (t, J = 7 Hz, 3H), 1.40-1.90 (m, 15H), 2.76-2.86 (m, 1H), 3.18-3.30 (m, 1H), 3.93 (t, J = 7 Hz, 2H), 4.32
30 (q, J = 7 Hz, 2H), 4.70-4.82 (m, 1H), 7.01 (t, J = 6 Hz, 1H), 7.54-7.86 (m, 2H), 8.36 (d, J = 4 Hz, 1H).

E. 5-[4-(N-(Pyridin-2-yl)-N-(tert-butylloxycarbonyl)amino)butyl]isoxazolin-3-carboxylic acid:
35 The product of Ex 667 part D, (10.7g, 0.027M) was dissolved in a mixture of 20 mL of tetrahydrofuran

and 20 mL of water, and cooled in an ice bath. Lithium hydroxide (1,73g, 0.41M) was dissolved in 5 ml of water and added to the ester solution. the reaction mixture was stirred for 45m. TLC of the reaction mixture (hexane/ ethyl acetate, 3:1) indicated that no ester remained. 1M Citric acid solution (40 mL) was added and the mixture was extracted several times with ethyl acetate (until TLC of the organic layer showed no product). The combined organic layers were dried over magnesium sulfate, filtered, and evaporated and dried under high vacuum to yield the title product as a light yellow semisolid (9.9g, 99%). ¹H NMR (CDCl₃): δ 1.24-1.82 (m, 12H), 2.78-2.9 (m, 1H), 3.20-3.32 (m, 1H), 3.90 (t J = 7 Hz, 2H), 4.78-4.90 (m, 1H), 7.10 (t J = 6 Hz, 1H), 7.52 (d, J = 8 Hz, 1H), 7.70 (t, J = 6 Hz, 1H), 8.42 (t, J = 4 Hz, 1H).
Mass spectrum m/z 364.3 (M+H, base peak)

20 F. tert-Butyl-2-(S)-benzyloxycarbonylamino-3-[5-(R,S)-(4-(N-(pyridin-2-yl)-N-(tert-butylloxycarbonyl)amino)butylisoxazolin-3-ylcarbonyl]aminopropionate:
tert-Butyl N²-benzyloxycarbonyl-2-(S)-2,3-diaminopropionate (M. Mokotoff and L. Logue, J. Med. Chem., 1981, 24, 554) (2.59 g, 8.806 mmol), and the carboxylic acid from Ex. 667 part E. (3.20 g, 8.806 mmol) were dissolved in N,N'-dimethylformamide (20mL). N'-methylemorpholine (2.72 g, 26.856 mmol) and
30 benzotriazol-1-yloxy-tris(dimethylamino)phosphonium hexafluorophosphate (4.09 g, 9.246 mmol) were added and the reaction mixture stirred for 48h at room temperature under nitrogen. Concentration in vacuo to an orange oil which was purified by silica gel flash column
35 chromatography (hexane / ethyl acetate (2:1), to yield the title compound as a pale yellow syrup (4.56 g, 83%

5 ^1H NMR (CDCl_3): δ 1.35-1.77 (m, 6H), 1.48 (s, 9H),
 1.50 (s, 9H), 2.74 - 2.83 (d of d, $J = 17.58$, 8.05 Hz,
 1H), 3.14 - 3.24 (d of d of d, $J = 17.58$, 8.05, 1.06 Hz,
 1H), 3.68 - 3.79 (m, 2H), 3.90 - 3.95 (t, $J = 6.96$ Hz,
 10 2H), 4.35 - 4.41 (m, 1H), 4.67 - 4.79 (m, 1H), 5.11
 (s, 2H), 5.66 - 5.69 d, $J = 6.96$ Hz, 1H), 6.94 - 6.97
 (t, $J = 5.36$ Hz, 1H), 6.98 - 7.06 (d of d, $J = 4.76$,
 1.84 Hz, 1H), 7.28 - 7.37 (m, 5H), 7.51 - 7.59 (t of
 d, $J = 6.96$, 1.84 Hz, 1H), 7.58 - 7.67 (t of d, $J =$
 6.96, 1.83 Hz, 1H), 8.35 - 8.39 (d of d, $J = 4.76$, 1.83,
 1H). Mass spectrum $m/z = 640.4$ (M + H), 264.2 (base
 peak).

15 G. 2-(S)-Benzyloxycarbonylamino-3-[5-(R,S)-(4-(N-
(pyridin-2-yl)amino)butyl)isoxazolin-3-
ylcarbonyl]aminopropionic acid: The product of Ex. 667
 part F (60 mg, 0.094 mmol) was dissolved in 4N HCl in
 dioxane (2 mL), and stirred at room temperature for 5
 h. under nitrogen. The solvent was evaporated in vacuo
 20 and the residue purified by reverse phase (C18) HPLC to
 yield the title compound (39 mg, 87 %). ^1H NMR
 (CDCl_3): δ 1.35-1.77 (m, 6H), 2.74 - 2.83 (m, 2H), 3.20-
 3.40 (m, 3H), 3.55-3.80 (m, 3H), 4.40 (br s, 1H), 4.55
 (br s, 1H), 5.02 (t, $J = 8$ Hz, 2H), 6.83 (br t, 1H),
 25 7.02 (d, 6 Hz, 1H), 7.28 (s, 5H), 7.78 (d, $J = 4$ Hz, 1H),
 7.85 (t, $J = 5$ Hz, 1H). Mass spectrum $m/z = 484.3$.
 (M+H).

Example 669

30 2-(S)-Phenylsulfonylamino-3-[5-(R,S)-(4-(N-(pyridin-2-
yl)amino)butyl)isoxazolin-3-ylcarbonyl]aminopropionic
acid trifluoroacetate salt

A. Methyl-2-(S)-phenylsulfonylamino-3-[5-(R,S)-(4-(N-(pyridin-2-yl)-N-(tert-butyloxycarbonyl)-amino)butylisoxazolin-3-ylcarbonyl]aminopropionate:

Methyl 3-amino-2-phenylsulfonylaminopropionate (

5 Hartman, G.D., Prugh, J. D., Egbertson, M. S., Duggan,
M. E. Hoffman, W. PCT Int. Appl WO 9408577 A1 940428) (
8.82 g, 24.3 mmol) and the product of Ex 667 part E, (
7.15 g, 24.257 mmol) was dissolved in N'N'-
dimethylformamide (100ml). N'-Methylmorpholine (7.61
10 g, 75.197 mmol) and Benzotriazol-1-yloxy-
tris(dimethylamino)phosphonium hexafluorophosphate
(12.88 g, 29.108 mmol) were added and the reaction
mixture stirred for 15 h. at room temperature under a
nitrogen atmosphere. The solvent was removed in vacuo to
15 provide the crude product as an orange syrup which was
purified by silica gel flash chromatography (hexane /
ethyl acetate, 1:1), to yield the title compound as a
light yellow oil (7.31 g, 57 %). ¹H NMR (CDCl₃): δ
1.34 - 1.77 (m, 6H), 1.50 (s, 9H), 2.59 - 2.68 (d of d,
20 J = 22.34, 9.52 Hz, 1H), 2.71 - 2.83 (d of d of d, J =
17.58, 8.42, 2.20 Hz, 1H), 2.88 - 2.96 (d, J = 22.34 Hz,
1H), 2.88 - 3.25 (d of d of d, J = 17.58, 10.62, 3.66
Hz, 1H), 3.59 (s, 3H), 3.62 - 3.69 (m, 2H), 3.93 - 3.98
(t, J = 7.33 Hz, 2H), 4.06 - 4.12 (m, 1H), 4.70 - 4.75
25 (c, 1H), 5.72 - 5.75 (d of d, J = 7.69, 3.36 Hz, 1H),
7.03 - 7.07 (d of d and c, J = 4.76, 1.84 Hz, 2H), 7.47
- 7.50 (t, J = 8.43 Hz, 3H), 7.52 - 7.65 (t, J = 9.15
Hz, 2H), 7.60 - 7.70, (d of d, J = 3.55, 1.83 Hz, 1H),
7.84 - 7.86 (d of d, J = 6.92, 1.46 Hz, 2H), 8.39 - 8.41
30 (d, J = 4.76 Hz, 1H). Mass spectrum m/z = 604.3 (M + H,
base peak).

B. 2-(S)-Phenylsulfonylamino-3-[5-(R,S)-(4-(N-(pyridin-2-yl)N-(tert-butyloxycarbonyl)amino)butylisoxazolin-3-ylcarbonyl)aminopropionic acid:

35 ylcarbonyl]aminopropionic acid:

Lithium hydroxide (0.71 g, 16.952 mmol) dissolved in water (10ml). In a separate flask the product of ex 669 part A, (7.31 g, 12.109 mmol) was dissolved in a mixture of methyl alcohol (200mL), water (10mL). The
5 lithium hydroxide solution was added and the reaction mixture was stirred at room temperature for 72 hrs. The resulting red solution was concentrated in vacuo and partitioned between ethyl acetate (100mL) and water (50mL). A mixture of 1M Hydrochloric Acid (17ml) in
10 Citric Acid (100ml) was added until the pH of the aqueous layer was ca. 4. The organic layer was separated and the aqueous layer extracted with ethyl Acetate (2 x 30ml). The combined organic layers were dried over anhydrous magnesium sulfate, filtered and the solvent removed in
15 vacuo to provide the title compound as a light yellow oil (6.50 g, 91%). ¹H NMR (CDCl₃): δ 1.34 - 1.77 (m, 6H), 1.50 (s, 9H), 2.59 - 2.68 (d of d, J = 22.34, 9.52 Hz, 1H), 2.71 - 2.83 (d of d of d, J = 17.58, 8.42, 2.20 Hz, 1H), 2.88 - 2.96 (d, J = 22.34 Hz, 1H), 2.88 - 3.25
20 (d of d of d, J = 17.58, 10.62, 3.66 Hz, 1H), 3.59 (s, 3H), 3.62 - 3.69 (m, 2H), 3.93 - 3.98 (t, J = 7.33 Hz, 2H), 4.06 - 4.12 (c, 1H), 4.70 - 4.75 (c, 1H), 5.80 - 5.86 (d of d, J = 7.69, 3.36 Hz, 1H), 6.12 - 6.15 (d, J = 8.06 Hz, 1H), 7.03 - 7.07 (d of d and c, J = 4.76,
25 1.84 Hz, 2H), 7.16 - 7.19 (d of d, J = 6.92, 1.46 Hz, 2H), 7.24 - 7.28 (t, J = 8.43 Hz, 3H), 7.38 - 7.57 (t and d of d, J = 9.15, 4.02, 2.93 Hz, 2H), 7.64 - 7.70 (c, 1H), 7.83 - 7.89 (t, J = 6.95 Hz, 1H), 8.39 - 8.41 (d, J = 4.76 Hz, 1H). Mass spectrum m/z = 590.2 (M + H,
30 base peak).

C. 2-(S)-Phenylsulfonylamino-3-[5-(R,S)-(4-(N-(pyridin-2-yl)amino)butylisoxazolin-3-ylcarbonyl)aminopropionic acid

35 Trifluoroacetic acid (10ml) was added to the product of Ex 669 part B, (6.50 g, 11.023 mmol) and the reaction

mixture was stirred for 3 h at room temperature under nitrogen. The solution was concentrated *in vacuo* then co-concentrated with toluene (3 x 100 mL). The resulting oil was purified by gradient reverse phase HPLC (Water / Acetonitrile) to yield the title compound as a white powder (4.78 g, 72% yield, 97.7 % purity). ¹H NMR (CD₃OD): δ 1.34 - 1.77 (m, 6H), 1.50 (s, 9H), 2.59 - 2.68 (d of d, J = 22.34, 9.52 Hz, 1H), 2.71 - 2.83 (d of d of d, J = 17.58, 8.42, 2.20 Hz, 1H), 2.88 - 2.96 (d, J = 22.34 Hz, 1H), 2.88 - 3.25 (d of d of d, J = 17.58, 10.62, 3.66 Hz, 1H), 3.30 - 3.36 (t, J = 7.33 Hz, 2H), 3.62 - 3.69 (m, 2H), 4.06 - 4.12 (c, 1H), 4.70 - 4.75 (c, 1H), 5.80 - 5.86 (d of d, J = 7.69, 3.36 Hz, 1H), 6.79 - 6.85 (d, J = 4.76 Hz, 1H), 7.00 - 7.03 (d of d, J = 9.16, 2.56 Hz, 1H), 7.46 - 7.51 (t, J = 7.69 Hz, 2H), 7.57 - 7.59 (t, J = 7.33 Hz, 1H), 7.76 - 7.87 (d, J = 6.96, 4H). Mass spectrum m/z = 490.2 (M + H, base peak). High resolution mass spectrum m/z 490.176031.

20

Example 695

[2(S)-Benzyloxycarbonylamino]-3-[5-[(6-aminopyridin-2-yl)propyl]isoxazolin-3-yl]carbonylaminopropionic acid, trifluoroacetate salt:

25

A. tert-Butyl-[2(S)-Benzyloxycarbonylamino]-3-[5-[(6-(2,5-dimethylpyrrolyl)pyridin-2-yl)propyl]isoxazolin-3-yl]carbonylaminopropionate: The product of Ex. 697, Part D (0.43 g, 1.30 mmol) was dissolved in N,N-dimethylformamide (10mL). (S)-t-Butyl-3-amino-2-benzyloxycarbonylamino-propionate (0.42 g, 1.43 mmol), triethylamine (0.29 g, 2.86 mmol) and O-(1H-benzotriazol-1-yl)-N,N,N',N'-tetramethyluronium tetrafluoroborate (0.46 g, 1.43 mmol), according to the procedure of Ex 284, Part F, to provide the title product (0.33g, 42%). ¹H NMR (CDCl₃) δ 1.46 (s, 9H),

30

35

1.86 (m, 4H), 2.12 (s, 6H), 2.87 (m, 3H), 3.22 (m, 1H),
3.74 (br s, 2H), 4.38 (m, 1H), 4.78 (m, 1H), 5.11 (s,
2H), 5.68, (bs, 1H), 5.89 (s, 2H), 6.97 (bs, 1H), 7.04
(d, 1H), 7.14 (d, 1H), 7.35 (m, 5H), 7.73 (t, 1H). Mass
5 spectrum: (ESI) m/z 604(M + H)⁺.

B. [2(S)-Benzyloxycarbonylamino]-3-[5-[(6-aminopyridin-
2-yl)propyl]isoxazolin-3-yl]carbonylaminopropionic
acid, trifluoroacetate salt: The compound of Ex. 695,
10 Part A (0.33 g, 0.54 mmol), hydroxylamine
hydrochloride (0.75 g, 10.8 mmol, and triethylamine (0.55 g, 5.42 mmol) are dissolved in a 4:1 mixture of
isopropanol / water (10.0mL) and refluxed. After 3.5
h, additional hydroxylamine hydrochloride (0.37 g, 5.40
15 mmol) and triethylamine (0.27 g, 2.71 mmol) are
added, and the reaction mixture refluxed for an
additional 4 h. The reaction mixture was cooled and
sodium carbonate (0.86 g, 8.13 mol) was added. The
reaction mixture was stirred for 16 h, then filtered,
20 and the filtrate concentrated. The crude amine was
dissolved in a mixture of methylene chloride (4.0mL)
and trifluoroacetic acid (1.0mL), and stirred for 16
h. The reaction mixture was concentrated to give a
thick yellow oil, which was partitioned between ethyl
25 acetate and water. The organic layer was separated and
dried over anhydrous sodium sulfate, filtered and
concentrated to give a yellow oil. The crude product
was purified by preparative reverse phase HPLC using a
gradient, 90:10 to 10:90, water / acetonitrile (0.05%
30 trifluoroacetic acid) as eluent, gave the desired
product as a trifluoroacetate salt, 15 mg (5%). ¹HNMR
(CDCl₃) δ 1.70 (m, 4H), 2.75 (m, 3H), 3.20 (m, 1H),
3.60 (m, 2H), 4.30 (m, 1H), 4.75 (m, 1H), 5.05 (s, 2H),
6.02 (bs, 1H), 6.59 (d, J = 8 Hz, 1H), 6.71 (d, J = 8
35 Hz, 1H), 7.35 (m, 5H), 7.68 (t, J = 8 Hz, 1H). Mass
spectrum: (ESI) m/z 470(M + H)⁺.

Example 697

[2-Phenylsulfonylamino]-3-[5-[(6-aminopyridin-2-yl)propyl]isoxazolin-3-yl]carbonylaminopropionic acid,
5 trifluoroacetate salt

A. 2-(2,5-Dimethyl-1H-pyrrol-1-yl)-6-methylpyridine:

2-Amino-6-methylpyridine (56.4g , 0.52 mol), 2,5-hexanedione (59.3 g, 0.52 mol) and acetic acid (5.0
10 mL) were refluxed in toluene (150 mL), under a Dean-Stark trap for 16 h. The mixture was cooled, an additional portion of 2,5-hexanedione (34.0 g, 0.30 mol) was added and reflux resumed for 7 h. The reaction mixture was cooled, and the solvent was evaporated and
15 the residue was dissolved in EtOAc and cautiously washed with saturated NaHCO₃, and then brine. The organic layer was dried with anhydrous sodium sulfate, filtered and concentrated. The residue was flash column chromatography (silica gel, hexane / ethyl acetate,
20 85:15) to provide 37.5g (39%) of the title product. ¹H NMR (CDCl₃) δ 2.12 (s, 6H), 2.59 (s, 3H), 5.88 (s, 2H), 7.02 (d, J = 8 Hz, 1H), 7.15 (d, J = 8 Hz, 1H). Mass spectrum: (ESI) m/z 187 (M + H)⁺.

25

B. 2-(2,5-dimethyl-1H-pyrrol-yl)-6-(4-pentenyl)pyridine:

The product of Ex 697 part A, (5.0 g, 0.027 mol) was dissolved in anhydrous tetrahydrofuran (45mL) and
30 cooled to -78 °C. A solution of lithium diisopropylamide (0.032mol) in anhydrous tetrahydrofuran (50mL) was precooled to 0 °C, and added to the reaction mixture. After stirring for 1.5 h at -78 °C, 4-bromo-2-butene (3.78 g, 0.028 mol) was
35 added. This mixture was stirred for an additional 0.5 h, and then allowed to warm to ambient temperature.

Saturated ammonium chloride (150mL) was added, the tetrahydrofuran was evaporated, and the aqueous solution extracted with ethyl acetate (150mL). The combined organic layers were washed with water (150mL) and brine (100mL), then dried over sodium sulfate, filtered and concentrated to yield 5.58g (86%) of the desired product. ¹H NMR (CDCl₃) δ 1.87 (m, 2H), 2.10 (t, J = 7.3 Hz, 2H), 2.13 (s, 6H), 2.83 (t, J = 7.3 Hz, 2H), 4.99 (m, 2H), 5.83 (m, 1H), 5.89 (s, 2H), 7.02 (d, J = 7.7 Hz, 1H), 7.13 (d, J = 7.7 Hz, 1H), 7.70 (t, J = 7.7 Hz, 1H). Mass spectrum: (ESI) m/z 241(M + H)⁺.

C. 5-Ethyl[6-[[[(2,5-dimethylpyrrolyl)pyridin-2-yl]propyl]isoxazolin-3-yl]carboxylate: The product of ex 697 part B, (2.4 g, 9.98 mmol) was dissolved in a 2:1 mixture of tetrahydrofuran and water (90mL). Sodium bicarbonate (5.01 g, 59.6 mmol) and ethyl chlorooximidoacetate (1.5g, 9.98mmol), according to the procedure of Ex 667, Part A, to provide the title product (1.01g, 29%). ¹H NMR (CDCl₃) δ 1.36 (t, 3H), 1.67 (m, 2H), 1.88 (m, 2H), 2.12 (s, 6H), 2.85 (m, 3H), 3.25 (m, 1H), 4.33 (q, 2H), 4.84 (m, 1H), 5.89 (s, 2H), 7.04 (d, 1H), 7.14 (d, 2H), 7.73 (t, 1H).

D. [6-[[[(2,5-Dimethylpyrrolyl)pyridin-2-yl]propyl]isoxazolin-3-yl]carboxylic acid: The product of Ex 697 part C, (1.01 g, 2.84 mmol) was hydrolyzed according to the procedure of Ex 667, Part E, to provide the title product (0.86g, 92%). ¹H NMR (DMSO) δ 1.61 (m, 2H), 1.76 (m, 2H), 2.04 (s, 6H), 2.79 (m, 3H), 3.22 (m, 1H), 4.77 (m, 1H), 5.78 (s, 1H), 7.20 (d, 1H), 7.30 (d, 1H), 7.88 (t, 1H).

Mass spectrum: (ESI) m/z 328(M + H)⁺.

E. Methyl-[2(S)-phenylsulfonylamino]-3-[5-[[6-(2,5-dimethylpyrrolyl)pyridin-2-yl]propyl]isoxazolin-3-

yl]carbonylaminopropionate: The product of Ex. 697, Part D (0.43 g, 1.30 mmol) was dissolved in N,N-dimethyl formamide (10mL), (S)-methyl-3-amino-2-phenylsulfonylaminopropionate (0.42 g, 1.43 mmol),
5 triethylamine (0.29 g, 2.86 mmol) and O-(1H-benzotriazol-1-yl)-N,N,N',N'-tetramethyluronium tetrafluoroborate (0.46 g, 1.43 mmol), were added according to the procedure of Ex 284, Part F, to provide the title product (0.23 g, 31%). ¹H NMR (CDCl₃) δ 1.85
10 (m, 4H), 2.13 (s, 6H), 2.79 (m, 1H), 2.88 (t, 2H), 3.23 (m, 1H), 3.67 (m, 1H), 4.11 (m, 1H), 4.79 (m, 1H), 5.76 (m, 1H), 5.89 (s, 2H), 7.02 (bs, 1H), 7.04 (d, 1H), 7.15 (d, 1H), 7.53 (m, 3H), 7.73 (t, 1H), 7.84 (d, 2H). Mass spectrum: (ESI) m/z 568(M + H)⁺.

15
F. [2(S)-Phenylsulfonylamino]-3-[5-[(6-aminopyridin-2-yl)propyl]isoxazolin-3-yl]carbonylaminopropionic acid, trifluoroacetate salt: The product of Ex, 697, Part E, (0.16 g, 0.29 mmol), hydroxylamine
20 hydrochloride (0.40 g, 5.81 mmol), and triethylamine (0.29 g, 2.91 mmol) were dissolved in a 4:1 mixture of isopropanol / water (10.0 mL) and refluxed . After 3.5 h, additional hydroxylamine hydrochloride (0.37 g, 5.40 mmol) and triethylamine (0.27 g, 2.71 mmol) were
25 added, and the reaction mixture refluxed for an additional 4 h. The reaction mixture was cooled and sodium carbonate (0.46 g, 4.36 mol) was added, the mixture was stirred 16 h. The reaction mixture was filtered and concentrated. The crude amine was taken up
30 in a 4:1 mixture of MeOH / water (10.0 mL) and LiOH·H₂O (0.012 g, 0.29 mmol) was added. The reaction mixture was stirred 16 h. The methanol was evaporated, and the crude carboxylic acid was dissolved in water and washed with EtOAc. The aqueous phase was adjusted to pH
35 = 4.5 with 1M HCl, and the solution absorbed on a pad of C₁₈ reverse phase gel. The pad was washed well with H₂O

and eluted with CH₃CN. The CH₃CN eluent was concentrated to give an oily solid. Purification by preparative reverse phase HPLC using a gradient 90:10 water / acetonitrile to 10:90, water / acetonitrile (0.05% trifluoroacetic acid) as eluent, gave the desired product as a TFA salt, 13mg (8%). ¹H NMR (CDCl₃) δ 1.80 (m, 4H), 2.81 (m, 3H), 3.21 (m, 1H), 3.60 (m, 2H), 4.15 (br s, 1H), 4.80 (br s, 1H), 6.75 (d, J = 4.5 Hz, 1H), 6.85 (d, J = 8.0 Hz, 1H), 7.56 (m, 4H), 7.82 (m, 3H). Mass spectrum: (ESI) m/z 476 (M + H)⁺.

Example 849

2-[(S)-((2,4,6-trimethylphenyl)sulfonyl)amino]-3-[5-(R,S)-(4-(N-(pyridin-2-yl)amino)butylisoxazolin-3-ylcarbonyl)aminopropionic acid

A. 2-(S)-amino-3-[5-(R,S)-(4-(N-(pyridin-2-yl)-N-(tert-butylloxycarbonyl)amino)butylisoxazolin-3-ylcarbonyl)aminopropionic acid tert-butyl ester:

To the product of example 667 part F, (1.5 g, 2.408 mmol), in methyl alcohol (50 mL) was added Palladium on Barium Sulfate unreduced (0.300 g, 0.482 mmol). The reaction mixture was exposed to hydrogen gas (41 p.s.i.) at room temperature for 15 hours. The reaction mixture was filtered through a celite pad and concentration *in vacuo* to afforded a light yellow syrup (1.22 g, quantitative yield). ¹H NMR (CDCl₃): δ 1.34 - 1.76 (m, 6H), 1.46 (s, 9H), 1.48 (s, 9H), 2.29 - 2.48 (br s, 2H), 2.78 - 2.87 (d of d, J = 17.58, 8.05 Hz, 1H), 3.19 - 3.28 (d of d of d, J = 17.58, 8.05, 1.06 Hz, 1H), 3.59 - 3.66 (m, 2H), 3.78 - 3.81 (m, 1H), 3.86 - 3.91 (t, J = 6.96 Hz, 2H), 4.69 - 4.78 (m, 1H), 6.98 - 7.02 (d of d, J = 4.76, 1.84 Hz, 1H), 7.12 - 7.14 (t, J = 5.36 Hz, 1H), 7.51 - 7.56 (t of d, J = 6.96, 1.84 Hz, 1H), 7.58 - 7.64 (t of d, J = 6.96, 1.83 Hz, 1H), 8.36 -

8.38 (d of d, $J = 4.76, 1.83$ Hz, 1H). Mass Spectrum $m/z = 506.4$ (M + H), 197.7 (base peak).

5 B. 2-[(S)-((2,4,6-trimethylphenyl)sulfonyl)amino]-3-[5-(R,S)-(4-(N-(pyridin-2-yl)amino)butylisoxazolin-3-ylcarbonyl)aminopropionic acid

The product of example 849 part A, (50 mg, 0.0949 mmol), and pyridine (202 mg, 2.585 mmol) were dissolved in dichloromethane (5 mL). 2,4,6-trimethylbenzenesulfonyl
10 chloride (26 mg, 0.119 mmol) was added and the reaction mixture was stirred at room temperature under nitrogen for 8 h. Saturated aqueous sodium bicarbonate (5 mL) was added and the organic layer was separated, dried
over anhydrous sodium carbonate and concentrated in
15 vacuo to a syrup. The product was treated with trifluoroacetic acid (5 ml) at room temperature and stirred for 1 hour. The reaction mixture was concentrated in vacuo to a syrup. Toluene (10 mL) was added and the mixture concentrated in vacuo again. The
20 resulting syrup was submitted to gradient HPLC (Water / Acetonitrile) The fractions containing the product were concentrated in vacuo and placed on a lyophilization apparatus overnight, to afford the title compound as a white powder (27 mg, 42% over two steps). ^1H NMR
25 (CD_3OD): δ 1.49 - 1.79 (m, 6H), 2.58 (s, 9H), 2.74-2.82 (d of d, $J = 17.58, 8.05$ Hz, 1H), 3.07 - 3.16 (d of d of d, $J = 17.58, 8.05, 1.06$ Hz, 1H), 3.31 - 3.36 (t, $J = 6.96$ Hz, 2H), 3.31 - 3.65 (d of d, $J = 13.55, 5.12$ Hz, 2H), 4.00 - 4.06 (m, 1H), 4.74 - 4.82 (m, 1H),
30 6.78 - 6.85 (d of d, $J = 5.86, 0.73$ Hz, 1H), 6.94 (s, 2H), 6.98 - 7.03 (d of d, $J = 4.40, 0.05$ Hz, 1H), 7.75 - 7.78 (t, $J = 5.86$ Hz, 1H), 7.81 - 7.86 (t, $J = 4.40$ Hz, 1H). Mass spectrum $m/z = 532.2$ (M + H , base peak).

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Example 951

3-{5-[4-(imidazol-2-ylamino)butyl]isoxazoline-3-carbonyl}amino-2S-(2,4,6-trimethylbenzenesulfonylamino)propionic acid trifluoroacetate salt

5

A. 2-Phthalamidoimidazole:

2-Aminoimidazole sulfate (2.64 g, 20 mmol) was dissolved in 200 mL of anhydrous methanol and cooled to -78°C. A 25% solution of sodium methoxide in methanol (4.57 mL, 20 mmol) was added dropwise. The reaction mixture was allowed to warm to room temperature and stirred for an additional 3 hours. The solution was filtered and concentrated on the rotary evaporator to a brown oil (1.6g, 96.4%). ¹H NMR (DMSO) δ 5.0 br.s, 2H, 6.32, s, 2H.

15 Phthalic anhydride (4.14 g, 29.2 mmol) and 2-aminoimidazole (2.32 g, 29.2 mmol) were heated to 170°C for 15 min. The crude reaction mixture was purified by flash chromatography (gradient chloroform:methanol 95:5-80:20) to yield 4.66 g (75%) of a brown solid. ¹H NMR (DMSO) δ 7.16 (br.s, 2H), 7.94-8.06 (m, 4H), 12.35 (br s, 1H). Mass spectrum ESI (M+H)⁺ 214.2

20

B. 1-Triphenylmethyl-2-phthalamidoimidazole.

The product of Ex. 949, Part A, (4.66g, 21.9 mmol) was dissolved in 100 mL of anhydrous pyridine and triphenylmethylchloride (9.15 g, 32.82 mmol) was added. The reaction mixture was refluxed for 24 hrs. Pyridine was removed and the residue was purified by flash column chromatography (chloroform:methanol 5-10%) to yield the desired product (2.74 g, 27.5% yield). ¹H NMR (CDCl₃) δ 6.80 (d, J = 1.1 Hz, 1H), 7.06 (t, J = 7.3 Hz, 3H), 7.17 (t, J = 7.7 Hz, 7H), 7.28 (d, 6H, 7.64, s 4H). Mass spectrum NH₃-DCI (M+H)⁺ 456.

25

30

C. 1-Triphenylmethyl-2-aminoimidazole.

35

The product of Ex. 949, Part B, (2.60 g, 5.7 mmol) and hydrazine (1.83 g, 57 mmol) were refluxed in 250 mL of anhydrous ethanol for 1 hr. The reaction mixture was cooled and the solvent removed in vacuo. the solid residue was
5 purified by flash column chromatography (chloroform:methanol 10:1) to yield 1.8 g (97%) of a yellow solid. ¹H NMR (DMSO) δ 6.26 (d, J = 1.8 Hz, 1H), 6.51 (d, J = 1.8 Hz, 1H), 7.13 (d, J = 7Hz, 6H), 7.33-7.44 (m, 9H). Mass spectrum NH₃-DCI (M+H), 326.

10

D. 3-Ethoxycarbonyl-5-[4-(1-triphenylmethylimidazol-2-ylamino)butyl]isoxazoline:

1-Triphenylmethyl-2-aminoimidazole (1.43 g, 4.4 mmol), the product of Ex. 667, Part B, (1.034 g, 4.85 mmol) and
15 magnesium sulfate (2.33 g, 19.4 mmol) were stirred in 250 mL of carbon tetrachloride at room temperature. Progress of the reaction was monitored by NMR. After 90 hrs magnesium sulfate was filtered off and triacetoxyborohydride (3.74 g, 17.65 mmol) was added. The reaction mixture was stirred for
20 an additional 48 hrs. Water (100 mL) was added, the organic layer was separated and the water layer was extracted with ethyl acetate. The combined organic layers were concentrated and purified by flash chromatography (ethyl acetate / hexane 1:1, then ethyl acetate, then ethyl
25 acetate:methanol 20:1) to yield the product as a colorless oil (1.7g, 74%); ¹H NMR (DMSO) δ 0.84-0.92 (m, 2H), 1.0 (m, 2H), 1.26 (t, J = 7.3 Hz, 3H), 1.31-1.48 (m, 2H), 2.70 (dd, J₁ = 17.6 Hz, J₂ = 8.4 Hz, 1H), 2.90 (q, J = 2.3 Hz, 2H), 3.07 (br. s, 1H), 3.20 (dd, J₁ = 11Hz, J₂ = 17.6 Hz, 1H),
30 4.25 (q, J = 7.3 Hz, 2H), 4.6 (m, 1H), 6.26 (d, J = 1.5 Hz, 1H), 7.50 (d, J = 1.5 Hz, 1H), 7.09 (m, 6H), 7.33-7.44 (m, 6H). Mass spectrum: NH₃-DCI (M+H)⁺, 523.

E. 5-[4-(1-triphenylmethylimidazol-2-ylamino)butyl]isoxazoline-3-carboxylic acid:

35

The product of Ex.949, Part D (246 mg, 0.47 mmol) was dissolved in of tetrahydrofuran (2 mL). A 0.5N solution of lithium hydroxide (0.94 mL, 0.47 mmol) was added. The reaction mixture was stirred for 1 h, then aqueous 1N HCl (0.47 mL, 0.47 mmol) was added and the solvent was evaporated. The crude product was purified by flash column chromatography (chloroform / methanol 10:1) to yield the product as a white solid (230 mg, 99%). ¹H NMR (DMSO) δ 0.84-0.1.31 (m, 6H), 2.57 (dd, $J_1 = 17.6$ Hz, $J_2 = 8.4$ Hz, 1H), 2.89 (q, $J = 6.6$ Hz, 1H), 3.07 (dd, $J_1 = 17.6$ Hz, $J_2 = 10.6$ Hz, 1 H), 4.0-4.15 (br.s, 1H), 4.36 (m, 1H), 6.26 (d, $J = 1.8$ Hz, 1H), 6.52 (d, $J = 1.6$ Hz, 1H), 7.10 (d, 6H), 7.34-7.44 (m, 9H). Mass spectrum NH₃-DCI (M+H)⁺ -CO₂H, 451.

15 G. N-(2,4,6-trimethylphenyl)sulfonyl-L-asparagine

L- Asparagine (20.0 g, 0.15M) was suspended in a mixture of tetrahydrofuran (130 mL) and water (250 mL). Triethylamine (49 g, 0.48M) was added followed by mesitylenesulfonyl chloride (49.7 g, 0.227M), The reaction mixture became slightly exothermic and the solids dissolved over a period of 0.5 h. to yield a yellow solution. The reaction mixture was stirred for 3 h at room temperature, then washed with ether, and methylene chloride. The aqueous layer was separated, and acidified to ca. pH = 1.5 with conc. HCl, during which time a thick precipitate formed. After 0.5h. the product was filtered, washed with water and dried to yield a white solid (34 g, 72%). m.p.= 193.5 - 195°C ¹H NMR (DMSO) δ 2.24 (s, 3H), 2.28 (dd, 1H), 2.45 (dd, 1H), 2.55 (s, 6H), 3.98 (m, 1H), 6.88 (br s, 1H), 6.99 (s, 2H), 7.32 (br s, 1H), 7.82 (d, 2H), 12.58 (br s, 1H). Mass spectrum ESI m/z = 315.2, (M+H base peak).

H. 3-Amino-2-(S)-N-(2,4,6-trimethylphenyl)sulfonylaminopropionic acid

35 Sodium hydroxide (32 g, 0.80 M), was dissolved in water (200 mL) and cooled in an ice bath. Bromine (19.2g, 0.12 M)

was added dropwise over 5 min. and the mixture allowed to stir for 15 min. The product of Ex.949, Part G, (31.44 g, 0.10 M), was added in several portions over a period of ca. 10 min. during which time the yellow color faded. The
5 reaction mixture was gently heated on a steam bath during which time the internal temperature rose to ca. 85 °C. After 1h, the reaction mixture was allowed to cool to room temperature then cooled in an ice bath. The reaction mixture was cautiously acidified to pH= 6 with conc. HCl, during
10 which time a solid formed and gas was evolved. The solid was filtered, washed with cold water, and allowed to dry overnight, to yield the product as a white solid (23.9 g, 83%). ¹H NMR (DMSO) δ 2.26 (s, 3H), 2.59 (s, 6H), 2.80 (dd, 1H), 2.94 (dd, 1H), 3.07 (dd, 1H), 7.06 (s, 2H). Mass
15 spectrum ESI m/z 287.2 (M+H, base peak).

I. tert-Butyl-3-Amino-2-(S)-N-(2,4,6-trimethylphenyl)sulfonylaminopropionate

The product of Ex.949, Part H, (11.45 g, 0.04M), was placed
20 in a Parr bottle, and dissolved in dioxane (170 mL), and conc. sulfuric acid (11 mL) was added. The reaction mixture was cooled in a dry ice / acetone bath and ca. 185 ml of isobutylene was added. The bottle was sealed and agitated for 114 h. The bottle was de-pressurized then purged with
25 nitrogen for a brief time. The reaction mixture was poured into a rapidly stirred mixture of water (225 mL) containing sodium hydroxide (17 g) and ether (600 mL) which had been pre-cooled in an ice bath. The layers were separated. The aqueous layer was extracted with additional ether. The pH of
30 the aqueous layer was carefully adjusted with conc. HCl to pH = 11 and extracted four times with ether. The organic layers from the pH 11 adjusted extraction were combined, dried with anhydrous sodium sulfate, filtered and evaporated to yield the product as a viscous oil which solidified (8.64g, 63%).
35 ¹H NMR (CDCl₃) δ 1.28 (s, 9H), 2.28 (s, 3H), 2.67 (s, 6H), 2.93 (m, 2H), 3.69 (m, 1H), 6.95 (s, 2H).

J. tert-Butyl 3-{5-[4-(1-triphenylmethylimidazol-2-ylamino)butyl]isoxazoline-3-carbonyl}amino-2-(S)-(2,4,6-trimethylbenzenesulfonylamino)propionate.

The product of Ex. 949, Part E, (98 mg, 0.198 mmol) was dissolved in N,N- dimethylformamide (2 mL). The product of Ex 949, Part I, (68 mg, 0.198 mmol), O-(1H-benzotriazol-1-yl)-N,N,N',N'-tetramethyluronium tetrafluoroborate (76 mg, 0.24 mmol) and triethylamine (69 mL, 0.495 mmol) were added and the reaction mixture was stirred at room temperature for 1.5 hrs. The solvent was evaporated and residue was purified by flash chromatography (chloroform / methanol 10:1) to yield the product as a white solid (135 mg, 83%). (NMR***) Mass spectrum (M+H)⁺ 819.4.

K. 3-{5-[4-(1-Triphenylmethylimidazol-2-ylamino)butyl]isoxazoline-3-carbonyl}amino-2-(S)-(2,4,6-trimethylbenzenesulfonylamino)propionic acid.

The product of Ex. 949, Part J, (130 mg, 0.16 mmol) was dissolved in a 1:1 mixture of trifluoroacetic acid and methylene chloride and stirred at room temperature for 5 hrs. The solvent was evaporated and crude product was purified on reverse phase HPLC (C18) to provide the desired product (75 mg, 73%). ¹H NMR (acetone) δ 0.99-1.48, m, 6H, 2.27, s, 3H, 2.62, s, 6H, 2.67, m, 1H, 3.04-3.21, m, 1H, 3.31, q, J = 6.6 Hz, 3.52-3.74, m, 1H, 4.14, m 1H, 4.60, m, 1H, 5.25, br.s, 1H, 6.70, d, J = 2.6 Hz, 6.85, d, 1H, 6.98, s, 2H, 7.14, d, J = 2.6 Hz, 7.33, m, 6H, 7.48, m, 9H, 7.68, q, 1H; mass spectrum, NH₃-DCI, 763.3, HRMS calc: 763.329094, found: 763.327781.

L. 3-{5-[4-(imidazol-2-ylamino)butyl]isoxazoline-3-carbonyl}amino-2S-(2,4,6-trimethylbenzenesulfonylamino)propionic acid trifluoroacetate salt

The product of Ex. 949, Part K, (20 mg, 27 μ mol) was dissolved in trifluoroacetic acid (2 mL). Water (0.01 mL) was added and the reaction mixture was refluxed for 1 h. The trifluoroacetic acid was evaporated and the crude reaction product was purified on reverse phase HPLC (C18) to yield the desired product as a white solid (10 mg, 58%). ^1H NMR δ 1.34-1.66, m 6H, 2.24, s, 3H, 2.53, s 6H, 2.67-2.76, m, 1H, 3.06-3.14, m 1H, 3.20, m, 2H, 3.30-3.48, m, 2H, 3.91, q, 1H, 4.70, m, 1H, 6.50, br, 1H, 6.95, s, 2H, 6.95, s, 2H, 7.94, m, 2H, 8.23, m, 1H, 11.9, s, 2H, 12.5-12.8, br., 1H.; Mass spectrum, ESI, (M+H)⁺ 521.4, HRMS; calc. 521.219050, found 521.21823.

Example 999j1

2-[(S)-((2,4,6-trimethylphenyl)sulfonyl)amino]-3-[5-(R,S)-(4-(N-(3,4,5,6-tetrahydropyridin-2-yl)amino)butylisoxazolin-3-ylcarbonyl)aminopropionic acid

The product of example 849, part B (12 mg, 0.019 mM) was dissolved in 50 mL of 1:1 ethyl alcohol and 2-propanol. 5% Palladium on barium sulfate (25 mg) was added and the reaction hydrogenated at 42 psi, at room temperature for 15h. The reaction mixture was purged with nitrogen, filtered and concentrated in vacuo. The resulting oil was purified by reverse phase HPLC (water/ acetonitrile gradient) to yield the title compound as a white powder. (9 mg, 75%) ^1H NMR (CD₃OD) δ 1.41-1.58 (m, 2H), 1.62-1.77 (m, 2H), 1.79-1.86 (m, 2H), 2.26 (s, 3H), 2.57-2.64 (m, 2H), 2.59 (s, 6H), 2.74-3.12 (m, 2H), 3.17-3.23 (m, 2H), 3.26-3.32 (m, 2H), 3.34-3.64 (m, 4H), 4.01-4.06 (m, 1H), 4.70-4.80 (m, 1H), 6.95 (s, 2H), 8.24-8.26 (q, 1H), 8.81-8.89 (br s, 1H); Mass spectrum, ESI, (M+H)⁺ 536.5, base peak.

Example 10013-[[3-[3-[(N-imidazolin-2-yl)amino]propyloxy]isoxazol-5-yl]carbonylamino]propionic acid

- 5 A. Methyl 3-[3-(tert-butyloxycarbonylamino)propyloxy]-
 5-isoxazolecarboxylate: Diethylazodicarboxylate (1.46g,
 8.39 mmol) was added dropwise to a mixture of methyl 3-
 hydroxy-5-isoxazolecarboxylate (1g, 4.55 mmol),
 triphenylphosphine (1.46g, 8.39 mmol), and 3-tert-
10 butyloxycarbonylamino-1-propanol (1.50g, 8.39 mmol) in
 anhydrous tetrahydrofuran (10 mL) at 0°C under nitrogen.
 After 1 h remove the ice bath and warm to room
 temperature overnight. Dilute with ethyl acetate (75
 mL) and wash with water (25 mL), saturated NaHCO₃ (25
15 mL), and brine (25 mL). Dry over MgSO₄ then evaporate
 the solvent *in vacuo*. The residue was chromatographed
 over silica gel (75g, 25 to 60% ethyl acetate/hex) to
 give the title compound (1.95g, 95%) as a waxy solid:
 ¹H NMR (300 MHz, CDCl₃) δ 6.53 (s, 1H), 4.74 (bs, 1H),
20 4.36 (t, 2H), 3.95 (s, 3H), 3.28 (q, 2H), 2.00 (m, 2H),
 1.44 (s, 9H); MS (CI-NH₃) *m/e* 318 (M+NH₄)⁺; HRMS calc'd
 for C₁₃H₂₀N₂O₆ + H: 301.1400, found 301.1403.

- B. 3-[3-(tert-butyloxycarbonylamino)propyloxy]-5-
25 isoxazole carboxylic acid: Sodium Hydroxide (0.52g,
 13.0 mmol) in water (10 mL) was added in one portion to
 the product of Ex. 1001, Part A (1.95g, 6.49 mmol) in
 methanol (20 mL) at room temperature. After 2 h the
 methanol was removed *in vacuo* and the residue was taken
30 up in water (60 mL). The aqueous solution was washed
 with ether (30 mL, discard), then acidified to pH<2 with
 10% HCl. Extraction with ethyl acetate (3 x 40 mL) was
 followed by washing the combined organic extracts with
 brine (40 mL) and drying over MgSO₄. The solvent was
35 evaporated *in vacuo* to provide the desired acid (1.60g,
 86%) as a white solid: ¹H NMR (300 MHz, CDCl₃) δ 6.93 (s,

1H), 4.23 (t, 2H), 3.05 (q, 2H), 1.82 (m, 2H), 1.37 (s, 9H); MS (CI-NH₃) m/e 304 (M+NH₄)⁺; HRMS calc'd for C₁₂H₁₈N₂O₆ + H: 287.1243, found 287.1259.

- 5 C. Ethyl 3-[3-[3-(tert-butyloxycarbonyl
amino)propyloxy]isoxazol-5-ylcarbonylamino]propionate:
Diisopropylethylamine (0.68g, 5.24 mmol) was added dropwise to the compound of Ex. 1001, Part B (0.5g, 1.75 mmol), O-(1H-benzotriazol-1-yl)-N,N,N',N'-
10 tetramethyluronium tetrafluoroborate (0.70g, 1.83 mmol), and ethyl β-alanine hydrochloride (0.28g, 1.83 mmol) in anhydrous dichloromethane (30 mL) at 0°C under nitrogen. After the addition was completed the mixture was allowed to warm to room temperature and stirred for 7 h. The
15 reaction was diluted with dichloromethane (75 mL) then washed with water (25 mL), 5% HCl (25 mL), saturated NaHCO₃ (25 mL), and brine (25 mL). After drying over MgSO₄ the solvent was evaporated in vacuo and the residue chromatographed on silica gel (30g, 40 to 75%
20 ethyl acetate/hexanes) to provide the title compound (0.23g, 34%) as a viscous oil: ¹H NMR (300 MHz, CDCl₃) δ 7.05 (bt, 1H), 6.49 (s, 1H), 4.68 (bs, 1H), 4.32 (t, 2H), 4.18 (q, 2H), 3.70 (q, 2H), 3.27 (q, 2H), 2.62 (t, 2H), 1.99 (m, 2H), 1.44 (s, 9H), 1.28 (t, 3H); MS (CI-NH₃) m/e 403 (M+NH₄)⁺; HRMS calc'd for C₁₇H₂₇N₃O₇ + H:
25 386.1927, found 386.1909.

- D. Ethyl 3-[3-(3-aminopropoxy)isoxazol-5-ylcarbonylamino]propionate: Trifluoroacetic acid (10
30 ml) was added in a slow stream to the compound of Ex. 1001, Part C (0.18g 0.47 mmol) in dichloromethane (10 mL) at room temperature. After 45 min the trifluoroacetic acid was removed in vacuo and the residue was azotopically dried by evaporation in vacuo
35 with toluene (20 mL), then place on a vacuum pump at 0.2 torr overnight. Upon dilution with chloroform the

product crystallized out and was isolated as a white solid (0.14g 75%): ^1H NMR (300 MHz, CDCl_3) δ 8.18 (bs, 3H), 7.80 (bt, 1H), 6.51 (s, 1H), 4.32 (m, 2H), 4.11 (q, 2H), 3.65 (q, 2H), 3.17 (m, 2H), 2.6 (t, 2H), 2.18 (m, 2H), 1.23 (t, 3H); MS (CI- NH_3) m/e 303 ($\text{M}+\text{NH}_4$) $^+$; HRMS calc'd for $\text{C}_{12}\text{H}_{29}\text{N}_3\text{O}_5 + \text{H}$: 286.1403, found 286.1404.

E. Ethyl 3-[3-[3-(imidazolin-2-ylamino)propyloxy]isoxazol-5-ylcarbonylamino]propionate:

the compound of Ex. 1001, part D (0.22 g, 0.77 mmol) and 2-methylmercapto-4,5-dihydroimidazole hydroiodide (0.38g, 1.54 mmol) were combined in ethanol (20 mL) and heated to reflux for 2 hours. The solvent was removed *in vacuo* and the residue was chromatographed over silica gel (20g, 9:3:1:0.6, chloroform, methanol, water, acetic acid, lower layer) to provide the desired product (0.13 g, %) as a clear viscous oil: ^1H NMR (300 MHz, $\text{D}_4\text{-MeOH}$) δ 6.61 (s, 1H), 4.34 (t, 2H), 4.12 (q, 2H), 3.70 (s, 4H), 3.60 (t, 2H), 3.39 (t, 3H), 2.63 (t, 2H), 2.08 (m, 2H), 1.23 (t, 3H); MS (CI- NH_3) m/e 354 ($\text{M}+\text{H}$) $^+$.

F. 3-[3-[3-(imidazolin-2-ylamino)propyloxy]isoxazol-5-ylcarbonylamino]propionic acid: Lithium hydroxide

(0.5M, 1 mL) was added to the compound of Ex. 1001, part E (0.13g, 0.25 mmol) in dioxane (2 mL) at room temperature. After 1 h the solution was acidified with HCl in dioxane (4M, 2 mL) and the solvent was removed *in vacuo*. The residue was chromatographed on silica gel (10g, 9:3:1:0.6, chloroform, methanol, water, acetic acid, lower layer) and the product fractions were evaporated *in vacuo*. The product was taken up in methanol (1 mL) and tetrahydrofuran was added slowly. The mixture was stirred overnight and the title product precipitated out as a white solid (32 mg): m.p. 144-7°C; ^1H NMR (300 MHz, $\text{d}_6\text{-DMSO}$) δ 8.81 (bs, 2H), 6.77 (s, 1H), 6.76 (bs, 1H), 4.24 (m, 2H), 3.60 (q, 2H), 3.32 (m,

4H), 3.28 (m, 2H), 2.12 (m, 2H), 1.81 (m, 2H); MS (CI-NH₃) m/e 326 (M+H)⁺; HRMS calc'd for C₁₃H₁₉N₅O₅ + H: 326.1464, found 326.1462.

5

Example 1003

2(S)--benzyloxycarbonylamino-3-[[3-[2-[(N-imidazolin-2-yl)amino]ethoxy]isoxazol-5-yl]carbonylamino]propionic acid

10 A. [2-(tert-butyloxycarbonylamino)ethyl]methanesulfonate:

Methanesulfonyl chloride (8.2g 71.6 mmol) in dichloromethane (45 mL) was added dropwise, over 8 min at ambient temperature to a stirring solution of 2-(tert-butylloxycarbonylamino)ethan-1-ol and TEA(9.83g, 97.3 mmol) in dichloromethane (150 mL). After 2.5 hr the reaction mixture was washed with 1N HCl (2 x 50 mL), water (2 x 50 mL), and brine (50 mL) then dried over MgSO₄. The solution was filtered, and the solvent
20 evaporated in vacuo to give the title compound (10.37g, 67%). The resulting waxy solid could be used without further purification: ¹H NMR (300MHZ CDCl₃) δ 4.9(bs,1H), 4.3(t,2H), 3.3(q,2H) 3.04(s,1H).

25 B. 3-[3-(tert-butylloxycarbonylamino)ethyloxy]-5-isoxazole carboxylic acid: The compound of Ex. 1003.

Part A (10.37g, 43.3 mmol) in dimethylformamide (25 mL) was added dropwise over 10 min to a stirring solution of methyl 3-hydroxy-5-isoxazolecarboxylate and sodium
30 carbonate (5.83g, 55mmol). The reaction was heated to 80°C for 3 h, then stirred at ambient temperture for 18 h. 10% Potassium carbonate (~ 200ml) was added to the reaction mixture and was stirred until the resulting precipitate dissolved. After cooling to 3°C the
35 solution was acidified to pH=2 with concentrated HCl. The solid was collected by vacuum filtration, washed

with water, then air dried to give the title compound (5.6g, 47.5%) as a white solid: mp 246°C vigorous bubbling -160-170°C; ¹H NMR (300MHz, CDCl₃) δ 6.51(s, 1H), 5.02(m, 1H), 4.35(t, 2H), 3.55(m, 2H), 1.43(s, 1H).

5
C. Methyl 2-benzyloxycarbonylamino-3-[3-[3-(tert-butylloxycarbonylamino)propyloxy]isoxazol-5-ylcarbamoylaminol]propionate: Triethylamine (1.7g, 16.7mmol) was added in one portion to a mixture of the
10 compound of Ex. 1003, Part B (1.68g, 6.2 mmol), 1-(3-dimethylaminopropyl)-3-ethylcarbodiimide hydrochloride (1.8g, 9.3 mmol), the compound of Ex. 1004, part A (2.14g, 7.4mmol) and hydroxybenztriazole (260mg 1.9mmol) in anhydrous dimethylformamide (10 mL) at ambient
15 temperature. After 14 h the reaction was diluted with 1N HCl to six time the volume. The acidic solution was then extracted with ethyl acetate (5 x 30 mL) and the combined organic extracts were washed with 10% K₂CO₃ (3 x 50 ml), water (2 x 25 mL), and brine (25 mL). After
20 drying over MgSO₄ the solvent was evaporated in vacuo. The crude product was triturated in 10% K₂CO₃, filtered, washed with water then air dried. The product thus obtained (1.85g 59%) was isolated as a white crystalline solid and could be used with out further purification:
25 ¹H NMR (300MHz, DMSO) δ 8.95 (m, 1H), 7.78 (d, 1H), 7.36-7.31 (m, 5H) 7.05 (m, 1H), 6.79 (s, 1H) 5.09-4.99 (dd, 2H), 4.35-4.28 (q, 1H), 4.23-4.19 (t, 2H), 3.62 (s, 3H), 3.58-3.56 (m, 2H), 3.32-3.28 (m, 2H), 1.37 (s, 9H); MS (DCI-NH₃) m/e 524 (M+NH₄)⁺.

30
D. 2-benzyloxycarbonylamino-3-[3-(2-tert-butylloxycarbonylamino)ethyloxy]isoxazol-5-yl carbonyl aminol]propionic acid: The compound of Ex. 1003, Part C (1.8 g, 3.6 mmol) was saponified using the procedure
35 outlined for Ex. 1, Part C. The acid (0.81 g, 92%) was isolated as a brittle foam: ¹H NMR (300 MHz, DMSO) δ 8.92

(m, 1H) 7.62 (d, 1H) 7.35-7.30 (m, 5H) 7.05 (m, 1H), 6.78 (s, 1H) 5.08-4.97 (dd, 2H) 4.27-4.19 (m, 3H) 3.60-3.55 (m, 2H) 3.31-3.28 (m, 2H) 1.37 (s, 9H); MS (DCI-NH₃) m/e 510 (M+NH₄)⁺.

5

E. 3-[3-(2-aminoethyloxy)]isoxazol-5-ylcarbonylamino]-2-benzyloxycarbonylamino propionic acid hydrochloride: A solution of HCl in dioxane (4M, 10 mL) was added to the compound of Ex. 1003, Part C (1.6 g, 3.25 mmol) in 10 mL of dioxane. The mixture was stirred for 3 h at room temperature at which time a white solid had precipitated out. The product was filtered and washed with ether then dried overnight under vacuum (1.25 g, 90%): ¹H NMR (300 MHz, DMSO) δ 12.83 (bs, 1H), 9.06 (t, 1H), 8.24 (bs, 3H), 7.64 (d, 1H), 7.32 (m, 5H), 6.87 (s, 1H), 5.00 (s, 2H), 4.42 (t, 2H), 4.22 (m, 1H), 3.56 (m, 2H), 3.21 (m, 2H); MS (CI-NH₃); HRMS calc'd for C₁₇H₂₁N₄O₇ + H: 393.1410, found 391.1391.

20 F. 2(S)-benzyloxycarbonylamino-3-[3-[2-(imidazolin-2-yl amino)ethyloxy]isoxazol-5-yl carbonyl amino]propionic acid: 2-methylthioimidazolinium iodide (114mg, 0.5mmol), the compound of Ex. 1003, Part E (0.10g, 0.23mmol), and dimethylamino pyridine (60mg) were taken up in 1 mL of pyridine then heated to reflux for 2-3 min. The reaction was cooled to between 70-80°C and stirred for 24hr. The solvent was removed in vacuo and the residue chromatographed on silica gel (20g, 9:3:1:0.6, chloroform, methanol, water, and acetic acid, bottom layer). The product fractions were evaporated in vacuo and the resulting solid recrystallized from methanol/acetone to yield the title compound (33mg, 31.2%) as a tan solid: mp 226.8°C dec; ¹H NMR (300MHz, DMSO) δ 8.82 (m, 1H), 7.33 (m, 5H) 6.75 (d, 1H) 4.99 (s, 2H) 4.30-4.27 (m, 2H), 3.58-3.52 (m, 7H),

35

3.33(m, 1H); Mass Spec (ESI) m/e 461 (M+H)⁺; HRMS calc'd for C₂₀H₂₅N₆O₇ + H: 461.1784, found 461.1789.

Example 1004

5 2(S)-benzyloxycarbonylamino-3-[[3-[3-[(N-imidazolin-2-yl)amino]propyloxy]isoxazol-5-yl]carbonylamino]propionic acid

A. Methyl 3-amino-2(S)-

10 (benzyloxycarbonyl)aminopropionate hydrochloride: A solution of 4N HCl in dioxane (20 mL) was added to 3-amino-2-(benzyloxycarbonyl)aminopropanoic acid (2.39g, 10 mmol) in methanol (20 mL) and the solution was stirred for 2 hours. The solvents was removed *in vacuo*
15 to give the methyl ester (2.74 g, 95%) as a white solid product. NMR (DMSO-d₆): δ 8.38 (b, 3H); 7.96 (d, 1H); 7.38 (m, 5H); 5.05 (s, 2H); 4.44 (m, 1H); 3.66 (s, 3H); 3.14 (m, 2H)

20 B. Methyl 2-benzyloxycarbonylamino-3-[3-[3-(tert-butyloxycarbonylamino)propyloxy]isoxazol-5-ylcarbonylamino]propionate: Diisopropylethylamine (0.54 g, 4.17 mmol) was added dropwise to a mixture of the compound of Ex. 1001, Part B (1.0 g, 3.48 mmol), 1-(3-dimethylaminopropyl)-3-ethylcarbodiimide hydrochloride
25 (0.70g, 3.65 mmol), and the compound of Example 1004, Part A (1.0g, 3.48 mmol) in anhydrous dimethylformamide (10 mL) at 0°C under nitrogen. After 48 h the reaction was diluted with water (75 mL) then extraced with ethyl
30 acetate (3 x 30 mL). The combined organic extracts were washed with water (2 x 25 mL) and brine (25 mL). After drying over MgSO₄ the sovent was evaporated *in vacuo* and the residue chromatographed on silica gel (30g, 30 to 75% ethyl acetate/hexanes) to provide the title compound
35 (0.90g, 50%) as a viscous oil: ¹H NMR (300 MHz, CDCl₃) δ 7.35 (m, 5H), 7.03 (bt, 1H), 6.49 (s, 1H), 5.78 (d, 1H),

5.13 (s, 1H), 4.73 (bt, 1H), 4.54 (q, 1H), 4.35 (t, 2H), 3.86 (t, 2H), 3.79 (s, 3H), 3.28 (q, 2H), 1.99 (m, 2H), 1.44 (s, 9H); MS (CI-NH₃) m/e 538 (M+NH₄)⁺; HRMS calc'd for C₂₄H₃₂N₄O₉ + H: 521.2248, found 521.2266.

5

C. 3-[3-[3-(tert-

butyloxycarbonylamino)propyloxy]isoxazol-5-yl carbonyl amino]-2-benzyloxycarbonylaminopropionic acid: The

compound of Ex. 1004, Part B (0.9g, 1.73 mmol) was saponified using the procedure outlined for Example 1001, Part C. The acid (0.81g, 92%) was isolated as a brittle foam: ¹H NMR (300 MHz, DMSO) δ 8.91 (bt, 1H), 7.62 (d, 1H), 7.34 (m, 5H), 6.91 (bt, 1H), 6.78 (s, 1H), 5.03 (dd, 2H), 4.22 (m, 3H), 3.59 (m, 2H), 3.05 (q, 2H), 1.84 (m, 2H), 1.37 (s, 9H); MS (CI-NH₃) m/e 524 (M+NH₄)⁺; HRMS calc'd for C₂₃H₃₀N₄O₉ + H: 507.2091, found 507.2105.

D. 3-[3-(3-aminopropyloxy)]isoxazol-5-ylcarbonylamino]-2(S)-benzyloxycarbonylaminopropionic acid hydrochloride:

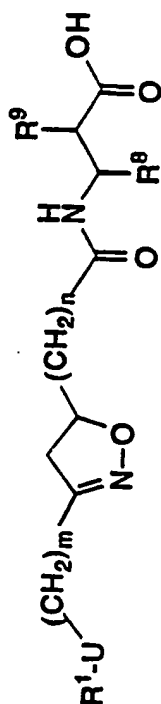
A solution of HCl in dioxane (4M, 10 mL) was added to the compound of Example 1004 Part C (0.81 g, 1.60 mmol) dropwise. The mixture was stirred for 3 h at room temperature, at which time a white solid had precipitated out. The product was filtered then washed with ether and dried overnight under vacuum (0.58 g, 82%): ¹H NMR (300 MHz, DMSO) δ 12.83 (s, 1H), 8.98 (t, 1H), 7.88 (bs, 3H), 7.64 (d, 1H), 7.34 (m, 5H), 6.83 (s, 1H), 5.03 (s, 2H), 4.31 (t, 2H), 4.27 (m, 1H), 3.40 (m, 2H), 2.92 (m, 2H), 2.04 (m, 2H); MS (CI-NH₃) m/e 407 (M+H)⁺; HRMS calc'd for C₁₈H₂₂N₄O₇ + H: 407.1567, found 407.1553.

E. 3-[3-[3-(imidazolin-2-yl amino)propyloxy]isoxazol-5-yl carbonyl amino]-2-benzyloxycarbonylaminopropionic acid hydroiodide: The compound of Ex. 1004, Part D

(0.42g, 0.95 mmol) and 2-methylmercapto-4,5-dihydroimidazole hydroiodide(0.35g, 1.42 mmol) were combined in pyridine (2 mL) and heated to reflux for 4 h. Additional 2-methylmercapto-4,5-dihydroimidazole hydroiodide(0.35g, 1.42 mmol) was added and the heating was continued for 2 h. The pyridine was removed in vacuo and the residue was chromatographed over silica gel (25 g, 9:3:1:0.6, chloroform, methanol, water, acetic acid, lower layer). The product fractions were combined and the solvent removed in vacuo. The residue was taken up in DMSO (1.5 ml) followed by addition of methanol (3 mL) then the slow addition of tetrahydrofuran (40 mL). The mixture was stirred for 30 min then filtered to provide the title compound (0.19g, 34%) as a tan solid: m.p. 201-2°C (dec); ¹H NMR 10.14 (bs, 1H), 9.64 (bs, 1H), 8.87 (bt, 1H), 7.34 (m, 5H), 6.78 (d, 1H), 6.75 (s, 1H), 5.00 (s, 2H), 4.22 (t, 2H), 3.85 (q, 1H), 3.56 (s, 4H), 3.55 (m, 1H), 3.23 (m, 3H), 1.92 (m, 2H); MS (esi) m/e 475 (M+H)⁺; HRMS calc'd for C₂₁H₂₆N₆O₇ + H: 475.1941, found 475.1942.

Using the above procedures and modifications known to one skilled in the art of organic synthesis the following additional examples of Tables 1-5 may be prepared.

Table 1



Ex. NO.	R ¹ -U	m	n	R ⁸	R ⁹	MS
1	tetrahydropyrimidin-2-ylamino	3	1	H	H	
2	tetrahydropyrimidin-2-ylamino	3	1	H	NHCbz	489.2
3	tetrahydropyrimidin-2-ylamino	3	1	H	NHtBOC	
4	tetrahydropyrimidin-2-ylamino	3	1	H	NHCO ₂ -nBu	
5	tetrahydropyrimidin-2-ylamino	3	1	H	NHCO ₂ Et	
6	tetrahydropyrimidin-2-ylamino	3	1	H	NHCO ₂ Me	
7	tetrahydropyrimidin-2-ylamino	3	1	H	NHCO(CH ₂) _n Ph	
8	tetrahydropyrimidin-2-ylamino	3	1	H	NHCotBu	
9	tetrahydropyrimidin-2-ylamino	3	1	H	NHCO-n-C ₅ H ₁₁	
10	tetrahydropyrimidin-2-ylamino	3	1	H	NHCO-n-C ₄ H ₉	

11	tetrahydropyrimidin- -2-ylamino	3	1	H	NHCOCH ₂ CH ₃
12	tetrahydropyrimidin- -2-ylamino	3	1	H	NHCOCH ₃
13	tetrahydropyrimidin- -2-ylamino	3	1	H	NHSO ₂ CH ₃
14	tetrahydropyrimidin- -2-ylamino	3	1	H	NHSO ₂ CH ₂ CH ₃
15	tetrahydropyrimidin- -2-ylamino	3	1	H	NHSO ₂ n-Bu
16	tetrahydropyrimidin- -2-ylamino	3	1	H	NHSO ₂ Ph
17	tetrahydropyrimidin- -2-ylamino	3	1	H	NHSO ₂ C ₆ H ₄ (4-CH ₃)
18	tetrahydropyrimidin- -2-ylamino	3	1	H	NHSO ₂ Bn
19	tetrahydropyrimidin- -2-ylamino	3	1	H	NHCO(2-pyridyl)
20	tetrahydropyrimidin- -2-ylamino	3	1	H	NHCO(3-pyridyl)
21	tetrahydropyrimidin- -2-ylamino	3	1	H	NHCO(4-pyridyl)
22	tetrahydropyrimidin- -2-ylamino	3	1	H	NHCOCH ₂ (2-pyridyl)
23	tetrahydropyrimidin- -2-ylamino	3	1	H	NHCOCH ₂ (3-pyridyl)
24	tetrahydropyrimidin- -2-ylamino	3	1	H	NHCOCH ₂ (4-pyridyl)
25	tetrahydropyrimidin- -2-ylamino	3	1	H	NHCO ₂ CH ₂ (2-pyridyl)

495.2

26	tetrahydropyrimidin-2-ylamino	3	1	H	NHCO ₂ CH ₂ (3-pyridyl)
27	tetrahydropyrimidin-2-ylamino	3	1	H	NHCO ₂ CH ₂ (4-pyridyl)
28	imidazolin-2-ylamino	3	1	H	H
29	imidazolin-2-ylamino	3	1	H	NHCbz
30	imidazolin-2-ylamino	3	1	H	NHtBOC
31	imidazolin-2-ylamino	3	1	H	NHCO ₂ -nBu
32	imidazolin-2-ylamino	3	1	H	NHCO ₂ Et
33	imidazolin-2-ylamino	3	1	H	NHCO ₂ Me
34	imidazolin-2-ylamino	3	1	H	NHCO(CH ₂) _n Ph
35	imidazolin-2-ylamino	3	1	H	NHCotBu
36	imidazolin-2-ylamino	3	1	H	NHCO-n-C ₅ H ₁₁
37	imidazolin-2-ylamino	3	1	H	NHCO-n-C ₄ H ₉
38	imidazolin-2-ylamino	3	1	H	NHCOCH ₂ CH ₃
39	imidazolin-2-ylamino	3	1	H	NHCOCH ₃
40	imidazolin-2-ylamino	3	1	H	NHSO ₂ CH ₃

41	imidazolin-2-ylamino	3	1	H	NHSO ₂ CH ₂ CH ₃
42	imidazolin-2-ylamino	3	1	H	NHSO ₂ n-Bu
43	imidazolin-2-ylamino	3	1	H	NHSO ₂ Ph
44	imidazolin-2-ylamino	3	1	H	NHSO ₂ C ₆ H ₄ (4-CH ₃)
45	imidazolin-2-ylamino	3	1	H	NHSO ₂ Bn
46	imidazolin-2-ylamino	3	1	H	NHCO (2-pyridyl)
47	imidazolin-2-ylamino	3	1	H	NHCO (3-pyridyl)
48	imidazolin-2-ylamino	3	1	H	NHCO (4-pyridyl)
49	imidazolin-2-ylamino	3	1	H	NHCOCH ₂ (2-pyridyl)
50	imidazolin-2-ylamino	3	1	H	NHCOCH ₂ (3-pyridyl)
51	imidazolin-2-ylamino	3	1	H	NHCOCH ₂ (4-pyridyl)
52	imidazolin-2-ylamino	3	1	H	NHCO ₂ CH ₂ (2-pyridyl)
53	imidazolin-2-ylamino	3	1	H	NHCO ₂ CH ₂ (3-pyridyl)
54	imidazolin-2-ylamino	3	1	H	NHCO ₂ CH ₂ (4-pyridyl)
55	tetrahydropyrimidin-2-ylamino	4	0	H	H

56	tetrahydropyrimidin -2-ylamino	4	0	H	NHCbz	489.3
57	tetrahydropyrimidin -2-ylamino	4	0	H	NHtBOC	
58	tetrahydropyrimidin -2-ylamino	4	0	H	NHCO ₂ -nBu	
59	tetrahydropyrimidin -2-ylamino	4	0	H	NHCO ₂ Et	
60	tetrahydropyrimidin -2-ylamino	4	0	H	NHCO ₂ Me	
61	tetrahydropyrimidin -2-ylamino	4	0	H	NHCO(CH ₂) _n Ph	
62	tetrahydropyrimidin -2-ylamino	4	0	H	NHCotBu	
63	tetrahydropyrimidin -2-ylamino	4	0	H	NHCO-n-C ₅ H ₁₁	
64	tetrahydropyrimidin -2-ylamino	4	0	H	NHCO-n-C ₄ H ₉	
65	tetrahydropyrimidin -2-ylamino	4	0	H	NHCOCH ₂ CH ₃	
66	tetrahydropyrimidin -2-ylamino	4	0	H	NHCOCH ₃	
67	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ CH ₃	
68	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ CH ₂ CH ₃	
69	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ n-Bu	
70	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ Ph	

71	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ (4-CH ₃)
72	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ Bn
73	tetrahydropyrimidin -2-ylamino	4	0	H	NHCO (2-pyridyl)
74	tetrahydropyrimidin -2-ylamino	4	0	H	NHCO (3-pyridyl)
75	tetrahydropyrimidin -2-ylamino	4	0	H	NHCO (4-pyridyl)
76	tetrahydropyrimidin -2-ylamino	4	0	H	NHCOCH ₂ (2-pyridyl)
77	tetrahydropyrimidin -2-ylamino	4	0	H	NHCOCH ₂ (3-pyridyl)
78	tetrahydropyrimidin -2-ylamino	4	0	H	NHCOCH ₂ (4-pyridyl)
79	tetrahydropyrimidin -2-ylamino	4	0	H	NHCO ₂ CH ₂ (2-pyridyl)
80	tetrahydropyrimidin -2-ylamino	4	0	H	NHCO ₂ CH ₂ (3-pyridyl)
81	tetrahydropyrimidin -2-ylamino	4	0	H	NHCO ₂ CH ₂ (4-pyridyl)
82	imidazolin-2- ylamino	4	0	H	H
83	imidazolin-2- ylamino	4	0	H	NHCbz
84	imidazolin-2- ylamino	4	0	H	NHtBOC
85	imidazolin-2- ylamino	4	0	H	NHCO ₂ -nBu

475.3

86	imidazolin-2-ylamino	4	0	H	NHCO ₂ Et
87	imidazolin-2-ylamino	4	0	H	NHCO ₂ Me
88	imidazolin-2-ylamino	4	0	H	NHCO(CH ₂) _n Ph
89	imidazolin-2-ylamino	4	0	H	NHCOtBu
90	imidazolin-2-ylamino	4	0	H	NHCO-n-C ₅ H ₁₁
91	imidazolin-2-ylamino	4	0	H	NHCO-n-C ₄ H ₉
92	imidazolin-2-ylamino	4	0	H	NHCOCH ₂ CH ₃
93	imidazolin-2-ylamino	4	0	H	NHCOCH ₃
94	imidazolin-2-ylamino	4	0	H	NHSO ₂ CH ₃
95	imidazolin-2-ylamino	4	0	H	NHSO ₂ CH ₂ CH ₃
96	imidazolin-2-ylamino	4	0	H	NHSO ₂ n-Bu
97	imidazolin-2-ylamino	4	0	H	NHSO ₂ Ph
98	imidazolin-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ (4-CH ₃)
99	imidazolin-2-ylamino	4	0	H	NHSO ₂ Bn
100	imidazolin-2-ylamino	4	0	H	NHCO(2-pyridyl)

101	imidazolin-2-ylamino	4	0	H	NHCO(3-pyridyl)
102	imidazolin-2-ylamino	4	0	H	NHCO(4-pyridyl)
103	imidazolin-2-ylamino	4	0	H	NHCOCH ₂ (2-pyridyl)
104	imidazolin-2-ylamino	4	0	H	NHCOCH ₂ (3-pyridyl)
105	imidazolin-2-ylamino	4	0	H	NHCOCH ₂ (4-pyridyl)
106	imidazolin-2-ylamino	4	0	H	NHCO ₂ CH ₂ (2-pyridyl)
107	imidazolin-2-ylamino	4	0	H	NHCO ₂ CH ₂ (3-pyridyl)
108	imidazolin-2-ylamino	4	0	H	NHCO ₂ CH ₂ (4-pyridyl)
109	tetrahydropyrimidin-2-ylamino	3	0	H	H
110	tetrahydropyrimidin-2-ylamino	3	0	H	NHCbz
111	tetrahydropyrimidin-2-ylamino	3	0	H	NHtBOC
112	tetrahydropyrimidin-2-ylamino	3	0	H	NHCO ₂ -nBu
113	tetrahydropyrimidin-2-ylamino	3	0	H	NHCO ₂ Et
114	tetrahydropyrimidin-2-ylamino	3	0	H	NHCO ₂ Me
115	tetrahydropyrimidin-2-ylamino	3	0	H	NHCO(CH ₂) _n Ph

475.3

116	tetrahydropyrimidin -2-ylamino	3	0	H	NHCotBu
117	tetrahydropyrimidin -2-ylamino	3	0	H	NHCO-n-C ₅ H ₁₁
118	tetrahydropyrimidin -2-ylamino	3	0	H	NHCO-n-C ₄ H ₉
119	tetrahydropyrimidin -2-ylamino	3	0	H	NHCOCH ₂ CH ₃
120	tetrahydropyrimidin -2-ylamino	3	0	H	NHCOCH ₃
121	tetrahydropyrimidin -2-ylamino	3	0	H	NHSO ₂ CH ₃
122	tetrahydropyrimidin -2-ylamino	3	0	H	NHSO ₂ CH ₂ CH ₃
123	tetrahydropyrimidin -2-ylamino	3	0	H	NHSO ₂ n-Bu
124	tetrahydropyrimidin -2-ylamino	3	0	H	NHSO ₂ Ph
125	tetrahydropyrimidin -2-ylamino	3	0	H	NHSO ₂ C ₆ H ₄ (4-CH ₃)
126	tetrahydropyrimidin -2-ylamino	3	0	H	NHSO ₂ Bn
127	tetrahydropyrimidin -2-ylamino	3	0	H	NHCO(2-pyridyl)
128	tetrahydropyrimidin -2-ylamino	3	0	H	NHCO(3-pyridyl)
129	tetrahydropyrimidin -2-ylamino	3	0	H	NHCO(4-pyridyl)
130	tetrahydropyrimidin -2-ylamino	3	0	H	NHCOCH ₂ (2-pyridyl)

481.2

131	tetrahydropyrimidin -2-ylamino	3	0	H	NHCOCH ₂ (3-pyridyl)	
132	tetrahydropyrimidin -2-ylamino	3	0	H	NHCOCH ₂ (4-pyridyl)	
133	tetrahydropyrimidin -2-ylamino	3	0	H	NHCO ₂ CH ₂ (2-pyridyl)	
134	tetrahydropyrimidin -2-ylamino	3	0	H	NHCO ₂ CH ₂ (3-pyridyl)	
135	tetrahydropyrimidin -2-ylamino	3	0	H	NHCO ₂ CH ₂ (4-pyridyl)	
136	imidazolin-2- ylamino	3	0	H	H	
137	imidazolin-2- ylamino	3	0	H	NHCbz	461.2
138	imidazolin-2- ylamino	3	0	H	NHtBOC	
139	imidazolin-2- ylamino	3	0	H	NHCO ₂ -nBu	
140	imidazolin-2- ylamino	3	0	H	NHCO ₂ Et	
141	imidazolin-2- ylamino	3	0	H	NHCO ₂ Me	
142	imidazolin-2- ylamino	3	0	H	NHCO(CH ₂) _n Ph	
143	imidazolin-2- ylamino	3	0	H	NHCotBu	
144	imidazolin-2- ylamino	3	0	H	NHCO-n-C ₅ H ₁₁	
145	imidazolin-2- ylamino	3	0	H	NHCO-n-C ₄ H ₉	

146	imidazolin-2-ylamino	3	0	H	NHCOCH ₂ CH ₃
147	imidazolin-2-ylamino	3	0	H	NHCOCH ₃
148	imidazolin-2-ylamino	3	0	H	NHSO ₂ CH ₃
149	imidazolin-2-ylamino	3	0	H	NHSO ₂ CH ₂ CH ₃
150	imidazolin-2-ylamino	3	0	H	NHSO ₂ n-Bu
151	imidazolin-2-ylamino	3	0	H	NHSO ₂ Ph
152	imidazolin-2-ylamino	3	0	H	NHSO ₂ C ₆ H ₄ (4-CH ₃)
153	imidazolin-2-ylamino	3	0	H	NHSO ₂ Bn
154	imidazolin-2-ylamino	3	0	H	NHCO (2-pyridyl)
155	imidazolin-2-ylamino	3	0	H	NHCO (3-pyridyl)
156	imidazolin-2-ylamino	3	0	H	NHCO (4-pyridyl)
157	imidazolin-2-ylamino	3	0	H	NHCOCH ₂ (2-pyridyl)
158	imidazolin-2-ylamino	3	0	H	NHCOCH ₂ (3-pyridyl)
159	imidazolin-2-ylamino	3	0	H	NHCOCH ₂ (4-pyridyl)
160	imidazolin-2-ylamino	3	0	H	NHCO ₂ CH ₂ (2-pyridyl)

161	imidazolin-2-ylamino	3	0	H	NHCO ₂ CH ₂ (3-pyridyl)	
162	imidazolin-2-ylamino	3	0	H	NHCO ₂ CH ₂ (4-pyridyl)	
172	pyridin-2-ylamino	3	1	H	NHCbz	484.2
173	pyridin-2-ylamino	3	1	H	NHCO ₂ -n-Bu	
174	pyridin-2-ylamino	3	1	H	NHSO ₂ Ph	
175	pyridin-2-ylamino	3	1	H	NHSO ₂ -nBu	
176	pyridin-2-ylamino	4	0	H	NHCbz	484.4
177	pyridin-2-ylamino	4	0	H	NHCO ₂ -n-Bu	
178	pyridin-2-ylamino	4	0	H	NHSO ₂ Ph	
179	pyridin-2-ylamino	4	0	H	NHSO ₂ -nBu	
180	pyridin-2-ylamino	3	0	H	NHCbz	
181	pyridin-2-ylamino	3	0	H	NHCO ₂ -n-Bu	
182	pyridin-2-ylamino	3	0	H	NHSO ₂ Ph	
183	pyridin-2-ylamino	3	0	H	NHSO ₂ -nBu	
184	imidazol-2-ylamino	3	1	H	NHCbz	

185	imidazol-2-ylamino	3	1	H	NHCO ₂ -n-Bu
186	imidazol-2-ylamino	3	1	H	NHSO ₂ Ph
187	imidazol-2-ylamino	3	1	H	NHSO ₂ -nBu
188	imidazol-2-ylamino	4	0	H	NHCbz
189	imidazol-2-ylamino	4	0	H	NHCO ₂ -n-Bu
190	imidazol-2-ylamino	4	0	H	NHSO ₂ Ph
191	imidazol-2-ylamino	4	0	H	NHSO ₂ -nBu
192	imidazol-2-ylamino	3	0	H	NHCbz
193	imidazol-2-ylamino	3	0	H	NHCO ₂ -n-Bu
194	imidazol-2-ylamino	3	0	H	NHSO ₂ Ph
195	imidazol-2-ylamino	3	0	H	NHSO ₂ -nBu
196	thiazol-2-ylamino	3	1	H	NHCbz
197	2-aminopyridin-6-yl	3	1	H	NHCO ₂ -n-Bu
198	2-aminopyridin-6-yl	3	1	H	NHSO ₂ Ph
199	2-aminopyridin-6-yl	3	1	H	NHSO ₂ -nBu

200	2-aminopyridin-6-yl	4	0	H	NHCbz
201	2-aminopyridin-6-yl	4	0	H	NHCO ₂ -n-Bu
202	2-aminopyridin-6-yl	4	0	H	NHSO ₂ Ph
203	2-aminopyridin-6-yl	4	0	H	NHSO ₂ -nBu
204	2-aminopyridin-6-yl	3	0	H	NHCbz
205	2-aminopyridin-6-yl	3	0	H	NHCO ₂ -n-Bu
206	2-aminopyridin-6-yl	3	0	H	NHSO ₂ Ph
207	2-aminopyridin-6-yl	3	0	H	NHSO ₂ -nBu
208	2-aminopyridin-3-yl	2	0	H	NHCbz
209	2-aminopyridin-3-yl	2	0	H	NHCO ₂ -n-Bu
210	2-aminopyridin-3-yl	2	0	H	NHSO ₂ Ph
211	2-aminopyridin-3-yl	2	0	H	NHSO ₂ -nBu
212	2-aminothiazol-4-yl	3	1	H	NHCbz
213	2-aminothiazol-4-yl	3	1	H	NHCO ₂ -n-Bu
214	2-aminothiazol-4-yl	3	1	H	NHSO ₂ Ph

215	2-aminothiazol-4-yl	3	1	H	NHSO ₂ -nBu
216	2-aminothiazol-4-yl	4	0	H	NHCbz
217	2-aminothiazol-4-yl	4	0	H	NHCO ₂ -n-Bu
218	2-aminothiazol-4-yl	4	0	H	NHSO ₂ Ph
219	2-aminopyridin-6-yl	4	0	H	NHSO ₂ -nBu
220	2-aminothiazol-4-yl	3	0	H	NHCbz
221	2-aminothiazol-4-yl	3	0	H	NHCO ₂ -n-Bu
222	2-aminothiazol-4-yl	3	0	H	NHSO ₂ Ph
223	2-aminothiazol-4-yl	3	0	H	NHSO ₂ -nBu
224	2-aminothiazol-4-yl	3	1	H	NHCbz
225	2-aminothiazol-4-yl	3	1	H	NHCO ₂ -n-Bu
284	imidazolin-2-ylamino	2	2	H	NHCbz
285	imidazolin-2-ylamino	2	2	H	NHCO ₂ -n-Bu
286	imidazolin-2-ylamino	2	2	H	NHSO ₂ Ph
287	imidazolin-2-ylamino	2	2	H	NHSO ₂ -nBu

475.3

288	tetrahydropyrimidin -2-ylamino	2	2	H	NHCbz	489.4
289	tetrahydropyrimidin -2-ylamino	2	2	H	NHCO ₂ -n-Bu	
290	tetrahydropyrimidin -2-ylamino	2	2	H	NHSO ₂ Ph	
291	tetrahydropyrimidin -2-ylamino	2	2	H	NHSO ₂ -nBu	
292	benzimidazol-2- ylamino	4	0	H	NHCbz	
293	benzthiazol-2- ylamino	4	0	H	NHCbz	
296	imidazol-4-ylamino	4	0	H	NHCbz	
303	2-iminopyrrolidin- 5-yl	3	1	H	NHCbz	
304	2-iminopyrrolidin- 5-yl	3	1	H	NHSO ₂ Ph	
305	2-iminopyrrolidin- 5-yl	3	0	H	NHCbz	
306	2-iminopyrrolidin- 5-yl	3	0	H	NHSO ₂ Ph	
307	2-iminopyrrolidin- 5-yl	2	1	H	NHCbz	
308	2-iminopyrrolidin- 5-yl	2	1	H	NHSO ₂ Ph	
309	2-iminopiperidin-6- yl	3	1	H	NHCbz	
310	2-iminopiperidin-6- yl	3	1	H	NHSO ₂ Ph	

311	2-iminopiperidin-6-yl	3	0	H	NHCbz
312	2-iminopiperidin-6-yl	3	0	H	NHSO ₂ Ph
313	2-iminopiperidin-6-yl	2	1	H	NHCbz
314	2-iminopiperidin-6-yl	2	1	H	NHSO ₂ Ph
315	2-iminoazepin-7-yl	3	1	H	NHCbz
316	2-iminoazepin-7-yl	3	1	H	NHSO ₂ Ph
317	2-iminoazepin-7-yl	3	0	H	NHCbz
318	2-iminoazepin-7-yl	3	0	H	NHSO ₂ Ph
319	2-iminoazepin-7-yl	2	1	H	NHCbz
320	2-iminoazepin-7-yl	2	1	H	NHSO ₂ Ph
321	benzimidazol-2-ylamino	4	0	n-Bu	H
322	benzthiazol-2-ylamino	4	0	n-Bu	H
325	imidazol-4-ylamino	4	0	n-Bu	H
335	thiazol-2-ylamino	4	0	H	NHCbz
340	imidazolin-2-ylamino	4	0	H	NHSO ₂ (2,4,6-trimethylphenyl)

490.4

341	imidazolin-2-ylamino	4	0	H	NHSO ₂ (2,4,6-trichlorophenyl)
342	imidazolin-2-ylamino	4	0	H	NHSO ₂ (2,6-dichlorophenyl)
343	imidazolin-2-ylamino	4	0	H	NHSO ₂ (2-chloro-6-methylphenyl)
344	imidazolin-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ (2-CH ₃)
345	imidazolin-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ (2-Br)
346	imidazolin-2-ylamino	4	0	H	NHSO ₂ [4-(2,6-dimethylphenyl)phenyl]
347	imidazolin-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ (4-Ph)
348	imidazolin-2-ylamino	4	0	H	NHSO ₂ [4-(3,5-dimethyl)isoxazolyl]
349	imidazolin-2-ylamino	4	0	H	NHSO ₂ (1-naphthyl)
350	imidazolin-2-ylamino	4	0	H	NHSO ₂ (2-naphthyl)
351	imidazolin-2-ylamino	4	0	H	NHSO ₂ NHCH ₂ Ph
352	imidazolin-2-ylamino	4	0	H	NHSO ₂ NHPh
353	imidazolin-2-ylamino	4	0	Ph	H
354	imidazolin-2-ylamino	4	0	phenylsulfonylamino methyl	H
355	imidazolin-2-ylamino	4	0	3-azabicyclo[3.2.2]nonan-3-ylcarbonyl	H

356	imidazolin-2-ylamino	4	0	adamantan-1-yl methylaminocarbonyl	H	
357	imidazolin-2-ylamino	4	0	adamantan-1-yl aminocarbonyl	H	
358	imidazolin-2-ylamino	4	0	adamantan-2-yl aminocarbonyl	H	
359	imidazolin-2-ylamino	4	0	tetrahydroisoquinolin-2-ylcarbonyl	H	
360	imidazolin-2-ylamino	3	1	H		NHSO ₂ (2,4,6-trimethylphenyl)
361	imidazolin-2-ylamino	3	1	H		NHSO ₂ (2,4,6-trichlorophenyl)
362	imidazolin-2-ylamino	3	1	H		NHSO ₂ (2,6-dichlorophenyl)
363	imidazolin-2-ylamino	3	1	H		NHSO ₂ (2-chloro-6-methylphenyl)
364	imidazolin-2-ylamino	3	1	H		NHSO ₂ C ₆ H ₄ (2-CH ₃)
365	imidazolin-2-ylamino	3	1	H		NHSO ₂ C ₆ H ₄ (2-Br)
366	imidazolin-2-ylamino	3	1	H		NHSO ₂ [4-(2,6-dimethylphenyl)phenyl]
367	imidazolin-2-ylamino	3	1	H		NHSO ₂ C ₆ H ₄ (4-Ph)
368	imidazolin-2-ylamino	3	1	H		NHSO ₂ [4-(3,5-dimethyl)isoxazoly]l]
369	imidazolin-2-ylamino	3	1	H		NHSO ₂ (1-naphthyl)
370	imidazolin-2-ylamino	3	1	H		NHSO ₂ (2-naphthyl)

371	imidazolin-2-ylamino	3	1	H	NHSO ₂ NHCH ₂ Ph
372	imidazolin-2-ylamino	3	1	H	NHSO ₂ NHPh
373	imidazolin-2-ylamino	3	1	Ph	H
374	imidazolin-2-ylamino	3	1	phenylsulfonylamino methyl	H
375	imidazolin-2-ylamino	3	1	3-azabicyclo[3.2.2] nonan-3-ylcarbonyl	H
376	imidazolin-2-ylamino	3	1	adamantan-1-yl methylaminocarbonyl	H
377	imidazolin-2-ylamino	3	1	adamantan-1-yl aminocarbonyl	H
378	imidazolin-2-ylamino	3	1	adamantan-2-yl aminocarbonyl	H
379	imidazolin-2-ylamino	3	1	tetrahydroisoquinol in-2-ylcarbonyl	H
380	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ (2,4,6-trimethylphenyl)
381	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ (2,4,6-trichlorophenyl)
382	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ (2,6-dichlorophenyl)
383	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ (2-chloro-6-methylphenyl)
384	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ (2-CH ₃)
385	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ (2-Br)

386	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ [4-(2,6- dimethylphenyl)phenyl]
387	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ (4-Ph)
388	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ [4-(3,5- dimethyl)isoxazolyl]
389	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ (1-naphthyl)
390	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ (2-naphthyl)
391	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ NHCH ₂ Ph
392	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ NHPh
393	tetrahydropyrimidin -2-ylamino	4	0	Ph	H
394	tetrahydropyrimidin -2-ylamino	4	0	phenylsulfonamino methyl	H
395	tetrahydropyrimidin -2-ylamino	4	0	3-azabicyclo[3.2.2] nonan-3-ylcarbonyl	H
396	tetrahydropyrimidin -2-ylamino	4	0	adamantan-1-yl methylaminocarbonyl	H
397	tetrahydropyrimidin -2-ylamino	4	0	adamantan-1-yl aminocarbonyl	H
398	tetrahydropyrimidin -2-ylamino	4	0	adamantan-2-yl aminocarbonyl	H
399	tetrahydropyrimidin -2-ylamino	4	0	tetrahydroisoquinol in-2-ylcarbonyl	H
400	tetrahydropyrimidin -2-ylamino	3	1	H	NHSO ₂ (2,4,6- trimethylphenyl)

401	tetrahydropyrimidin -2-ylamino	3	1	H	NHSO ₂ (2,4,6- trichlorophenyl)
402	tetrahydropyrimidin -2-ylamino	3	1	H	NHSO ₂ (2,6- dichlorophenyl)
403	tetrahydropyrimidin -2-ylamino	3	1	H	NHSO ₂ (2-chloro-6- methylphenyl)
404	tetrahydropyrimidin -2-ylamino	3	1	H	NHSO ₂ C ₆ H ₄ (2-CH ₃)
405	tetrahydropyrimidin -2-ylamino	3	1	H	NHSO ₂ C ₆ H ₄ (2-Br)
406	tetrahydropyrimidin -2-ylamino	3	1	H	NHSO ₂ [4-(2,6- dimethylphenyl)phenyl]
407	tetrahydropyrimidin -2-ylamino	3	1	H	NHSO ₂ C ₆ H ₄ (4-Ph)
408	tetrahydropyrimidin -2-ylamino	3	1	H	NHSO ₂ [4-(3,5- dimethyl)isoxazolyl]
409	tetrahydropyrimidin -2-ylamino	3	1	H	NHSO ₂ (1-naphthyl)
410	tetrahydropyrimidin -2-ylamino	3	1	H	NHSO ₂ (2-naphthyl)
411	tetrahydropyrimidin -2-ylamino	3	1	H	NHSO ₂ NHCH ₂ Ph
412	tetrahydropyrimidin -2-ylamino	3	1	H	NHSO ₂ NHPh
413	tetrahydropyrimidin -2-ylamino	3	1	Ph	H
414	tetrahydropyrimidin -2-ylamino	3	1	phenylsulfonylamino methyl	H
415	tetrahydropyrimidin -2-ylamino	3	1	3-azabicyclo[3.2.2] nonan-3-ylcarbonyl	H

416	tetrahydropyrimidin -2-ylamino	3	1	adamantan-1-yl methylethylaminocarbonyl	H	
417	tetrahydropyrimidin -2-ylamino	3	1	adamantan-1-yl aminocarbonyl	H	
418	tetrahydropyrimidin -2-ylamino	3	1	adamantan-2-yl aminocarbonyl	H	
419	tetrahydropyrimidin -2-ylamino	3	1	tetrahydroisoquinol in-2-ylcarbonyl	H	
420	imidazol-2-ylamino	4	0	H		NHSO ₂ (2,4,6- trimethylphenyl)
421	imidazol-2-ylamino	4	0	H		NHSO ₂ (2,4,6- trichlorophenyl)
422	imidazol-2-ylamino	4	0	H		NHSO ₂ (2,6- dichlorophenyl)
423	imidazol-2-ylamino	4	0	H		NHSO ₂ (2-chloro-6- methylphenyl)
424	imidazol-2-ylamino	4	0	H		NHSO ₂ C ₆ H ₄ (2-CH ₃)
425	imidazol-2-ylamino	4	0	H		NHSO ₂ C ₆ H ₄ (2-Br)
426	imidazol-2-ylamino	4	0	H		NHSO ₂ [4-(2,6- dimethylphenyl)phenyl]
427	imidazol-2-ylamino	4	0	H		NHSO ₂ C ₆ H ₄ (4-Ph)
428	imidazol-2-ylamino	4	0	H		NHSO ₂ [4-(3,5- dimethyl)isoxazolyl]
429	imidazol-2-ylamino	4	0	H		NHSO ₂ (1-naphthyl)
430	imidazol-2-ylamino	4	0	H		NHSO ₂ (2-naphthyl)

431	imidazol-2-ylamino	4	0	H	NHSO ₂ NHCH ₂ Ph
432	imidazol-2-ylamino	4	0	H	NHSO ₂ NHPh
433	imidazol-2-ylamino	4	0	Ph	H
434	imidazol-2-ylamino	4	0	phenylsulfonfylamino methyl	H
435	imidazol-2-ylamino	4	0	3-azabicyclo[3.2.2] nonan-3-ylcarbonyl	H
436	imidazol-2-ylamino	4	0	adamantan-1-yl methyloaminocarbonyl	H
437	imidazol-2-ylamino	4	0	adamantan-1-yl aminocarbonyl	H
438	imidazol-2-ylamino	4	0	adamantan-2-yl aminocarbonyl	H
439	imidazol-2-ylamino	4	0	tetrahydroisoquinol in-2-ylcarbonyl	H
440	imidazol-2-ylamino	3	1	H	NHSO ₂ (2,4,6- trimethylphenyl)
441	imidazol-2-ylamino	3	1	H	NHSO ₂ (2,4,6- trichlorophenyl)
442	imidazol-2-ylamino	3	1	H	NHSO ₂ (2,6- dichlorophenyl)
443	imidazol-2-ylamino	3	1	H	NHSO ₂ (2-chloro-6- methylphenyl)
444	imidazol-2-ylamino	3	1	H	NHSO ₂ C ₆ H ₄ (2-CH ₃)
445	imidazol-2-ylamino	3	1	H	NHSO ₂ C ₆ H ₄ (2-Br)

446	imidazol-2-ylamino	3	1	H	NHSO ₂ [4-(2,6-dimethylphenyl)phenyl NHSO ₂ C ₆ H ₄ (4-Ph)
447	imidazol-2-ylamino	3	1	H	
448	imidazol-2-ylamino	3	1	H	NHSO ₂ [4-(3,5-dimethyl)isoxazolyl] NHSO ₂ (1-naphthyl)
449	imidazol-2-ylamino	3	1	H	
450	imidazol-2-ylamino	3	1	H	NHSO ₂ (2-naphthyl)
451	imidazol-2-ylamino	3	1	H	NHSO ₂ NHCH ₂ Ph
452	imidazol-2-ylamino	3	1	H	NHSO ₂ NHPh
453	imidazol-2-ylamino	3	1	Ph	H
454	imidazol-2-ylamino	3	1	phenylsulfonylamino methyl	H
455	imidazol-2-ylamino	3	1	3-azabicyclo[3.2.2] nonan-3-ylcarbonyl	H
456	imidazol-2-ylamino	3	1	adamantan-1-yl methylaninocarbonyl	H
457	imidazol-2-ylamino	3	1	adamantan-1-yl aminocarbonyl	H
458	imidazol-2-ylamino	3	1	adamantan-2-yl aminocarbonyl	H
459	imidazol-2-ylamino	3	1	tetrahydroisoquinol in-2-ylcarbonyl	H
460	2-aminoimidazol-4-yl	3	0	H	NHSO ₂ (2,4,6-trimethylphenyl)

461	2-aminoimidazol-4-yl	3	0	H	NHSO ₂ (2,4,6-trichlorophenyl)
462	2-aminoimidazol-4-yl	3	0	H	NHSO ₂ (2,6-dichlorophenyl)
463	2-aminoimidazol-4-yl	3	0	H	NHSO ₂ (2-chloro-6-methylphenyl)
464	2-aminoimidazol-4-yl	3	0	H	NHSO ₂ C ₆ H ₄ (2-CH ₃)
465	2-aminoimidazol-4-yl	3	0	H	NHSO ₂ C ₆ H ₄ (2-Br)
466	2-aminoimidazol-4-yl	3	0	H	NHSO ₂ [4-(2,6-dimethylphenyl)phenyl]
467	2-aminoimidazol-4-yl	3	0	H	NHSO ₂ C ₆ H ₄ (4-Ph)
468	2-aminoimidazol-4-yl	3	0	H	NHSO ₂ [4-(3,5-dimethyl)isoxazolyl]
469	2-aminoimidazol-4-yl	3	0	H	NHSO ₂ (1-naphthyl)
470	2-aminoimidazol-4-yl	3	0	H	NHSO ₂ (2-naphthyl)
471	2-aminoimidazol-4-yl	3	0	H	NHSO ₂ NHCH ₂ Ph
472	2-aminoimidazol-4-yl	3	0	H	NHSO ₂ NHPh
473	2-aminoimidazol-4-yl	3	0	Ph	H
474	2-aminoimidazol-4-yl	3	0	phenylsulfonylamino methyl	H
475	2-aminoimidazol-4-yl	3	0	3-azabicyclo[3.2.2] nonan-3-ylcarbonyl	H

476	2-aminoimidazol-4-yl	3	0	adamantan-1-yl methylaminocarbonyl	H
477	2-aminoimidazol-4-yl	3	0	adamantan-1-yl aminocarbonyl	H
478	2-aminoimidazol-4-yl	3	0	adamantan-2-yl aminocarbonyl	H
479	2-aminoimidazol-4-yl	3	0	tetrahydroisoquinolin-2-ylcarbonyl	H
480	2-aminoimidazol-4-yl	2	1	H	NHSO ₂ (2,4,6-trimethylphenyl)
481	2-aminoimidazol-4-yl	2	1	H	NHSO ₂ (2,4,6-trichlorophenyl)
482	2-aminoimidazol-4-yl	2	1	H	NHSO ₂ (2,6-dichlorophenyl)
483	2-aminoimidazol-4-yl	2	1	H	NHSO ₂ (2-chloro-6-methylphenyl)
484	2-aminoimidazol-4-yl	2	1	H	NHSO ₂ C ₆ H ₄ (2-CH ₃)
485	2-aminoimidazol-4-yl	2	1	H	NHSO ₂ C ₆ H ₄ (2-Br)
486	2-aminoimidazol-4-yl	2	1	H	NHSO ₂ [4-(2,6-dimethylphenyl)phenyl]
487	2-aminoimidazol-4-yl	2	1	H	NHSO ₂ C ₆ H ₄ (4-Ph)
488	2-aminoimidazol-4-yl	2	1	H	NHSO ₂ [4-(3,5-dimethyl)isoxazolyl]
489	2-aminoimidazol-4-yl	2	1	H	NHSO ₂ (1-naphthyl)
490	2-aminoimidazol-4-yl	2	1	H	NHSO ₂ (2-naphthyl)

491	2-aminoimidazol-4-yl	2	1	H	NHSO ₂ NHCH ₂ Ph
492	2-aminoimidazol-4-yl	2	1	H	NHSO ₂ NHPh
493	2-aminoimidazol-4-yl	2	1	Ph	H
494	2-aminoimidazol-4-yl	2	1	phenylsulfonfylamino methyl	H
495	2-aminoimidazol-4-yl	2	1	3-azabicyclo[3.2.2]nonan-3-ylcarbonyl	H
496	2-aminoimidazol-4-yl	2	1	adamantan-1-yl methylaminocarbonyl	H
497	2-aminoimidazol-4-yl	2	1	adamantan-1-yl aminocarbonyl	H
498	2-aminoimidazol-4-yl	2	1	adamantan-2-yl aminocarbonyl	H
499a	2-aminoimidazol-4-yl	2	1	tetrahydroisoquinol in-2-ylcarbonyl	H
499b	benzimidazol-2-ylamino	4	0	H	NHSO ₂ (2,4,6-trimethylphenyl)
499c	benzimidazol-2-ylamino	4	0	H	NHSO ₂ (2,4,6-trichlorophenyl)
499d	benzimidazol-2-ylamino	4	0	H	NHSO ₂ (2,6-dichlorophenyl)
499e	benzimidazol-2-ylamino	4	0	H	NHSO ₂ (2-chloro-6-methylphenyl)
499f	benzimidazol-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ (2-CH ₃)
499g	benzimidazol-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ (2-Br)

499h	benzimidazol-2-ylamino	4	0	H	NHSO ₂ {4-(2,6-dimethylphenyl)phenyl}
499i	benzimidazol-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ (4-Ph)
499j	benzimidazol-2-ylamino	4	0	H	NHSO ₂ {4-(3,5-dimethyl)isoxazolyl}
499k	benzimidazol-2-ylamino	4	0	H	NHSO ₂ (1-naphthyl)
499l	benzimidazol-2-ylamino	4	0	H	NHSO ₂ (2-naphthyl)
499m	benzimidazol-2-ylamino	4	0	H	NHSO ₂ NHCH ₂ Ph
499n	benzimidazol-2-ylamino	4	0	H	NHSO ₂ NHPh
499o	benzimidazol-2-ylamino	4	0	Ph	H
499p	benzimidazol-2-ylamino	4	0	phenylsulfonylamino methyl	H
499q	benzimidazol-2-ylamino	4	0	3-azabicyclo[3.2.2]nonan-3-ylcarbonyl	H
499r	benzimidazol-2-ylamino	4	0	adamantan-1-yl methylaminocarbonyl	H
499s	benzimidazol-2-ylamino	4	0	adamantan-1-yl aminocarbonyl	H
499t	benzimidazol-2-ylamino	4	0	adamantan-2-yl aminocarbonyl	H
499u	benzimidazol-2-ylamino	3	1	tetrahydroisquinolin-2-ylcarbonyl	H
				H	NHSO ₂ (2,4,6-trimethylphenyl)

499v	benzimidazol-2-ylamino	3	1	H	NHSO ₂ (2,4,6-trichlorophenyl)
499w	benzimidazol-2-ylamino	3	1	H	NHSO ₂ (2,6-dichlorophenyl)
499x	benzimidazol-2-ylamino	3	1	H	NHSO ₂ (2-chloro-6-methylphenyl)
499y	benzimidazol-2-ylamino	3	1	H	NHSO ₂ C ₆ H ₄ (2-CH ₃)
499z	benzimidazol-2-ylamino	3	1	H	NHSO ₂ C ₆ H ₄ (2-Br)
499aa	benzimidazol-2-ylamino	3	1	H	NHSO ₂ [4-(2,6-dimethylphenyl)phenyl]
499ab	benzimidazol-2-ylamino	3	1	H	NHSO ₂ C ₆ H ₄ (4-Ph)
499ac	benzimidazol-2-ylamino	3	1	H	NHSO ₂ [4-(3,5-dimethyl)isoxazolyl]
499ad	benzimidazol-2-ylamino	3	1	H	NHSO ₂ (1-naphthyl)
499ae	benzimidazol-2-ylamino	3	1	H	NHSO ₂ (2-naphthyl)
499af	benzimidazol-2-ylamino	3	1	H	NHSO ₂ NHCH ₂ Ph
499ag	benzimidazol-2-ylamino	3	1	H	NHSO ₂ NHPh
499ah	benzimidazol-2-ylamino	3	1	Ph	H
499ai	benzimidazol-2-ylamino	3	1	phenylsulfonylamino methyl	H
499aj	benzimidazol-2-ylamino	3	1	3-azabicyclo[3.2.2] nonan-3-ylcarbonyl	H

499ak	benzimidazol-2-ylamino	3	1	adamantan-1-yl methylaminocarbonyl	H
499al	benzimidazol-2-ylamino	3	1	adamantan-1-yl aminocarbonyl	H
499am	benzimidazol-2-ylamino	3	1	adamantan-2-yl aminocarbonyl	H
499an	benzimidazol-2-ylamino	3	1	tetrahydroisoquinol in-2-ylcarbonyl	H
499ao	4-methylimidazol-2-ylamino	4	0	H	NHSO ₂ (2,4,6-trimethylphenyl)
499ap	4-methylimidazol-2-ylamino	4	0	H	NHSO ₂ (2,4,6-trichlorophenyl)
499aq	4-methylimidazol-2-ylamino	4	0	H	NHSO ₂ (2,6-dichlorophenyl)
499ar	4-methylimidazol-2-ylamino	4	0	H	NHSO ₂ (2-chloro-6-methylphenyl)
499as	4-methylimidazol-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ (2-CH ₃)
499at	4-methylimidazol-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ (2-Br)
499au	4-methylimidazol-2-ylamino	4	0	H	NHSO ₂ [4-(2,6-dimethylphenyl)phenyl]
499av	4-methylimidazol-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ (4-Ph)
499aw	4-methylimidazol-2-ylamino	4	0	H	NHSO ₂ [4-(3,5-dimethyl)isoxazolyl]
499ax	4-methylimidazol-2-ylamino	4	0	H	NHSO ₂ (1-naphthyl)
499ay	4-methylimidazol-2-ylamino	4	0	H	NHSO ₂ (2-naphthyl)

499az	4-methylimidazol-2-ylamino	4	0	H	NHSO ₂ NHCH ₂ Ph
499ba	4-methylimidazol-2-ylamino	4	0	H	NHSO ₂ NHPh
499bb	4-methylimidazol-2-ylamino	4	0	Ph	H
499bc	4-methylimidazol-2-ylamino	4	0	phenylsulfonfylamino methyl	H
499bd	4-methylimidazol-2-ylamino	4	0	3-azabicyclo[3.2.2] nonan-3-ylcarbonyl	H
499be	4-methylimidazol-2-ylamino	4	0	adamantan-1-yl methylaminocarbonyl	H
499bf	4-methylimidazol-2-ylamino	4	0	adamantan-1-yl aminocarbonyl	H
499bg	4-methylimidazol-2-ylamino	4	0	adamantan-2-yl aminocarbonyl	H
499bh	4-methylimidazol-2-ylamino	4	0	tetrahydroisoquinol in-2-ylcarbonyl	H
499bi	4-methylimidazol-2-ylamino	3	1	H	NHSO ₂ (2,4,6-trimethylphenyl)
499bj	4-methylimidazol-2-ylamino	3	1	H	NHSO ₂ (2,4,6-trichlorophenyl)
499bk	4-methylimidazol-2-ylamino	3	1	H	NHSO ₂ (2,6-dichlorophenyl)
499bl	4-methylimidazol-2-ylamino	3	1	H	NHSO ₂ (2-chloro-6-methylphenyl)
499bm	4-methylimidazol-2-ylamino	3	1	H	NHSO ₂ C ₆ H ₄ (2-CH ₃)
499bn	4-methylimidazol-2-ylamino	3	1	H	NHSO ₂ C ₆ H ₄ (2-Br)

499bo	4-methylimidazol-2-ylamino	3	1	H	NHSO ₂ [4-(2,6-dimethylphenyl)phenyl]
499bp	4-methylimidazol-2-ylamino	3	1	H	NHSO ₂ C ₆ H ₄ (4-Ph)
499bq	4-methylimidazol-2-ylamino	3	1	H	NHSO ₂ [4-(3,5-dimethyl)isoxazolyl]
499br	4-methylimidazol-2-ylamino	3	1	H	NHSO ₂ (1-naphthyl)
499bs	4-methylimidazol-2-ylamino	3	1	H	NHSO ₂ (2-naphthyl)
499bt	4-methylimidazol-2-ylamino	3	1	H	NHSO ₂ NHCH ₂ Ph
499bu	4-methylimidazol-2-ylamino	3	1	H	NHSO ₂ NHPh
499bv	4-methylimidazol-2-ylamino	3	1	Ph	H
499bw	4-methylimidazol-2-ylamino	3	1	phenylsulfonylamino methyl	H
499bx	4-methylimidazol-2-ylamino	3	1	3-azabicyclo[3.2.2] nonan-3-ylcarbonyl	H
499by	4-methylimidazol-2-ylamino	3	1	adamantan-1-yl methylaminocarbonyl	H
499bz	4-methylimidazol-2-ylamino	3	1	adamantan-1-yl aminocarbonyl	H
499ca	4-methylimidazol-2-ylamino	3	1	adamantan-2-yl aminocarbonyl	H
499cb	4-methylimidazol-2-ylamino	3	1	tetrahydroisoquinol in-2-ylcarbonyl	H
499cc	4,5-dimethylimidazol-2-ylamino	4	0	H	NHSO ₂ (2,4,6-trimethylphenyl)

499cd	4,5-dimethylimidazol-2-ylamino	4	0	H	NHSO ₂ (2,4,6-trichlorophenyl)
499ce	4,5-dimethylimidazol-2-ylamino	4	0	H	NHSO ₂ (2,6-dichlorophenyl)
499cf	4,5-dimethylimidazol-2-ylamino	4	0	H	NHSO ₂ (2-chloro-6-methylphenyl)
499cg	4,5-dimethylimidazol-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ (2-CH ₃)
499ch	4,5-dimethylimidazol-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ (2-Br)
499ci	4,5-dimethylimidazol-2-ylamino	4	0	H	NHSO ₂ [4-(2,6-dimethylphenyl)phenyl]
499cj	4,5-dimethylimidazol-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ (4-Ph)
499ck	4,5-dimethylimidazol-2-ylamino	4	0	H	NHSO ₂ [4-(3,5-dimethyl)isoxazolyl]
499cl	4,5-dimethylimidazol-2-ylamino	4	0	H	NHSO ₂ (1-naphthyl)
499cm	4,5-dimethylimidazol-2-ylamino	4	0	H	NHSO ₂ (2-naphthyl)
499cn	4,5-dimethylimidazol-2-ylamino	4	0	H	NHSO ₂ NHCH ₂ Ph
499co	4,5-dimethylimidazol-2-ylamino	4	0	H	NHSO ₂ NHPh
499cp	4,5-dimethylimidazol-2-ylamino	4	0	Ph	H

499cq	4,5-dimethylimidazol-2-ylamino	4	0	phenylsulfonfylamino methyl	H
499cr	4,5-dimethylimidazol-2-ylamino	4	0	3-azabicyclo[3.2.2]nonan-3-ylcarbonyl	H
499cs	4,5-dimethylimidazol-2-ylamino	4	0	adamantan-1-yl methylaminocarbonyl	H
499ct	4,5-dimethylimidazol-2-ylamino	4	0	adamantan-1-yl aminocarbonyl	H
499cu	4,5-dimethylimidazol-2-ylamino	4	0	adamantan-2-yl aminocarbonyl	H
499cv	4,5-dimethylimidazol-2-ylamino	4	0	tetrahydroisoquinol in-2-ylcarbonyl	H
499cw	4,5-dimethylimidazol-2-ylamino	3	1	H	NHSO ₂ (2,4,6-trimethylphenyl)
499cx	4,5-dimethylimidazol-2-ylamino	3	1	H	NHSO ₂ (2,4,6-trichlorophenyl)
499cy	4,5-dimethylimidazol-2-ylamino	3	1	H	NHSO ₂ (2,6-dichlorophenyl)
499cz	4,5-dimethylimidazol-2-ylamino	3	1	H	NHSO ₂ (2-chloro-6-methylphenyl)
499da	4,5-dimethylimidazol-2-ylamino	3	1	H	NHSO ₂ C ₆ H ₄ (2-CH ₃)
499db	4,5-dimethylimidazol-2-ylamino	3	1	H	NHSO ₂ C ₆ H ₄ (2-Br)
499dc	4,5-dimethylimidazol-2-ylamino	3	1	H	NHSO ₂ [4-(2,6-dimethylphenyl)phenyl]

499de	4,5-dimethylimidazol-2-ylamino	3	1	H	NHSO ₂ C ₆ H ₄ (4-Ph)
499df	4,5-dimethylimidazol-2-ylamino	3	1	H	NHSO ₂ [4-(3,5-dimethyl)isoxazoly1]
499dg	4,5-dimethylimidazol-2-ylamino	3	1	H	NHSO ₂ (1-napthyl)
499dh	4,5-dimethylimidazol-2-ylamino	3	1	H	NHSO ₂ (2-napthyl)
499di	4,5-dimethylimidazol-2-ylamino	3	1	H	NHSO ₂ NHCH ₂ Ph
499dj	4,5-dimethylimidazol-2-ylamino	3	1	H	NHSO ₂ NHPh
499dk	4,5-dimethylimidazol-2-ylamino	3	1	Ph	H
499dl	4,5-dimethylimidazol-2-ylamino	3	1	phenylsulfonylamino methyl	H
499dm	4,5-dimethylimidazol-2-ylamino	3	1	3-azabicyclo [3.2.2] nonan-3-ylcarbonyl	H
499dn	4,5-dimethylimidazol-2-ylamino	3	1	adamantan-1-yl methylaminocarbonyl	H
499do	4,5-dimethylimidazol-2-ylamino	3	1	adamantan-1-yl aminocarbonyl	H
499dp	4,5-dimethylimidazol-2-ylamino	3	1	adamantan-2-yl aminocarbonyl	H
499dq	4,5-dimethylimidazol-2-ylamino	3	1	tetrahydroisquinol in-2-ylcarbonyl	H

499dr	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	4	0	H	NHSO ₂ (2,4,6-trimethylphenyl)
499ds	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	4	0	H	NHSO ₂ (2,4,6-trichlorophenyl)
499dt	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	4	0	H	NHSO ₂ (2,6-dichlorophenyl)
499du	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	4	0	H	NHSO ₂ (2-chloro-6-methylphenyl)
499dv	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ (2-CH ₃)
499dw	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ (2-Br)
499dx	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	4	0	H	NHSO ₂ [4-(2,6-dimethylphenyl)phenyl]
499dy	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ (4-Ph)
499dz	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	4	0	H	NHSO ₂ [4-(3,5-dimethyl)isoxazolyl]
499ea	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	4	0	H	NHSO ₂ (1-naphthyl)
499eb	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	4	0	H	NHSO ₂ (2-naphthyl)
499ec	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	4	0	H	NHSO ₂ NHCH ₂ Ph
499ed	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	4	0	H	NHSO ₂ NHPh

499ee	4,5,6,7- tetrahydrobenzimidaz zol-2-ylamino	4	0	Ph	H
499ef	4,5,6,7- tetrahydrobenzimidaz zol-2-ylamino	4	0	phenylsulfonylamino methyl	H
499eg	4,5,6,7- tetrahydrobenzimidaz zol-2-ylamino	4	0	3-azabicyclo[3.2.2] nonan-3-ylcarbonyl	H
499eh	4,5,6,7- tetrahydrobenzimidaz zol-2-ylamino	4	0	adamantan-1-yl methyaminocarbonyl	H
499ei	4,5,6,7- tetrahydrobenzimidaz zol-2-ylamino	4	0	adamantan-1-yl aminocarbonyl	H
499ej	4,5,6,7- tetrahydrobenzimidaz zol-2-ylamino	4	0	adamantan-2-yl aminocarbonyl	H
499ek	4,5,6,7- tetrahydrobenzimidaz zol-2-ylamino	4	0	tetrahydroisoquinol in-2-ylcarbonyl	H
499el	4,5,6,7- tetrahydrobenzimidaz zol-2-ylamino	3	1	H	NHSO ₂ (2,4,6- trimethylphenyl)
499em	4,5,6,7- tetrahydrobenzimidaz zol-2-ylamino	3	1	H	NHSO ₂ (2,4,6- trichlorophenyl)
499en	4,5,6,7- tetrahydrobenzimidaz zol-2-ylamino	3	1	H	NHSO ₂ (2,6- dichlorophenyl)
499eo	4,5,6,7- tetrahydrobenzimidaz zol-2-ylamino	3	1	H	NHSO ₂ (2-chloro-6- methylphenyl)
499ep	4,5,6,7- tetrahydrobenzimidaz zol-2-ylamino	3	1	H	NHSO ₂ C ₆ H ₄ (2-CH ₃)
499eq	4,5,6,7- tetrahydrobenzimidaz zol-2-ylamino	3	1	H	NHSO ₂ C ₆ H ₄ (2-Br)

499er	4,5,6,7-tetrahydrobenzimidazole-2-ylamino	3	1	H	NHSO ₂ [4-(2,6-dimethylphenyl)phenyl]
499es	4,5,6,7-tetrahydrobenzimidazole-2-ylamino	3	1	H	NHSO ₂ C ₆ H ₄ (4-Ph)
499et	4,5,6,7-tetrahydrobenzimidazole-2-ylamino	3	1	H	NHSO ₂ [4-(3,5-dimethyl)isoxazolyl]
499eu	4,5,6,7-tetrahydrobenzimidazole-2-ylamino	3	1	H	NHSO ₂ (1-naphthyl)
499ev	4,5,6,7-tetrahydrobenzimidazole-2-ylamino	3	1	H	NHSO ₂ (2-naphthyl)
499ew	4,5,6,7-tetrahydrobenzimidazole-2-ylamino	3	1	H	NHSO ₂ NHCH ₂ Ph
499ex	4,5,6,7-tetrahydrobenzimidazole-2-ylamino	3	1	H	NHSO ₂ NHPh
499ey	4,5,6,7-tetrahydrobenzimidazole-2-ylamino	3	1	Ph	H
499ez	4,5,6,7-tetrahydrobenzimidazole-2-ylamino	3	1	phenylsulfonylamino methyl	H
499fa	4,5,6,7-tetrahydrobenzimidazole-2-ylamino	3	1	3-azabicyclo[3.2.2]nonan-3-ylcarbonyl	H
499fb	4,5,6,7-tetrahydrobenzimidazole-2-ylamino	3	1	adamantan-1-yl methylaminocarbonyl	H
499fc	4,5,6,7-tetrahydrobenzimidazole-2-ylamino	3	1	adamantan-1-yl aminocarbonyl	H
499fd	4,5,6,7-tetrahydrobenzimidazole-2-ylamino	3	1	adamantan-2-yl aminocarbonyl	H

499fe	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	3	1	tetrahydroisoquinolin-2-ylcarbonyl	H
499ff	pyridin-2-ylamino	4	0		H
499fg	pyridin-2-ylamino	4	0		NHSO ₂ (2,4,6-trimethylphenyl)
499fh	pyridin-2-ylamino	4	0		H
499fi	pyridin-2-ylamino	4	0		NHSO ₂ (2,4,6-trichlorophenyl)
499fj	pyridin-2-ylamino	4	0		NHSO ₂ (2,6-dichlorophenyl)
499fk	pyridin-2-ylamino	4	0		H
499fl	pyridin-2-ylamino	4	0		NHSO ₂ (2-chloro-6-methylphenyl)
499fm	pyridin-2-ylamino	4	0		NHSO ₂ C ₆ H ₄ (2-CH ₃)
499fn	pyridin-2-ylamino	4	0		H
499fo	pyridin-2-ylamino	4	0		NHSO ₂ C ₆ H ₄ (2-Br)
499fp	pyridin-2-ylamino	4	0		H
499fq	pyridin-2-ylamino	4	0		NHSO ₂ [4-(2,6-dimethylphenyl)phenyl]
499fr	pyridin-2-ylamino	4	0		NHSO ₂ C ₆ H ₄ (4-Ph)
499fs	pyridin-2-ylamino	4	0		H
499ft	pyridin-2-ylamino	4	0		NHSO ₂ [4-(3,5-dimethyl)isoxazolyl]
499fu	pyridin-2-ylamino	4	0		NHSO ₂ (1-naphthyl)
499fv	pyridin-2-ylamino	4	0		H
499fw	pyridin-2-ylamino	4	0		NHSO ₂ (2-naphthyl)
499fx	pyridin-2-ylamino	4	0		H
499fy	pyridin-2-ylamino	4	0		NHSO ₂ NHCH ₂ Ph
499fz	pyridin-2-ylamino	4	0		NHSO ₂ NHPh
499ga	pyridin-2-ylamino	4	0		H

499ft	pyridin-2-ylamino	4	0	phenylsulfonfylamino methyl	H
499fu	pyridin-2-ylamino	4	0	3-azabicyclo[3.2.2] nonan-3-ylcarbonyl	H
499fv	pyridin-2-ylamino	4	0	adamantan-1-yl methylanilnocarbonyl	H
499fw	pyridin-2-ylamino	4	0	adamantan-1-yl aminocarbonyl	H
499fy	pyridin-2-ylamino	4	0	adamantan-2-yl aminocarbonyl	H
499fz	pyridin-2-ylamino	4	0	tetrahydroisoquinol in-2-ylcarbonyl	H
499ga	pyridin-2-ylamino	3	1	H	NHSO ₂ (2,4,6- trimethylphenyl)
499gb	pyridin-2-ylamino	3	1	H	NHSO ₂ (2,4,6- trichlorophenyl)
499gc	pyridin-2-ylamino	3	1	H	NHSO ₂ (2,6- dichlorophenyl)
499gd	pyridin-2-ylamino	3	1	H	NHSO ₂ (2-chloro-6- methylphenyl)
499ge	pyridin-2-ylamino	3	1	H	NHSO ₂ C ₆ H ₄ (2-CH ₃)
499gf	pyridin-2-ylamino	3	1	H	NHSO ₂ C ₆ H ₄ (2-Br)
499gh	pyridin-2-ylamino	3	1	H	NHSO ₂ [4-(2,6- dimethylphenyl)phenyl]
499gi	pyridin-2-ylamino	3	1	H	NHSO ₂ C ₆ H ₄ (4-Ph)
499gk	pyridin-2-ylamino	3	1	H	NHSO ₂ [4-(3,5- dimethyl)isoxazolyl]

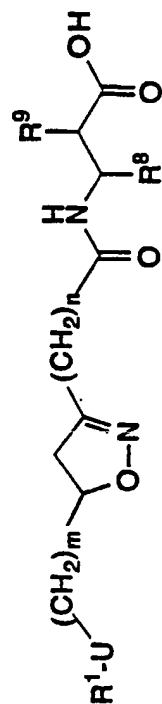
499gl	pyridin-2-ylamino	3	1	H	NHSO ₂ (1-napthyl)
499gm	pyridin-2-ylamino	3	1	H	NHSO ₂ (2-napthyl)
499gn	pyridin-2-ylamino	3	1	H	NHSO ₂ NHCH ₂ Ph
499go	pyridin-2-ylamino	3	1	H	NHSO ₂ NHPh
499gp	pyridin-2-ylamino	3	1	Ph	H
499gq	pyridin-2-ylamino	3	1	phenylsulfonfylamino methyl	H
499gr	pyridin-2-ylamino	3	1	3-azabicyclo[3.2.2] nonan-3-ylcarbonyl	H
499gs	pyridin-2-ylamino	3	1	adamantan-1-yl	H
499gt	pyridin-2-ylamino	3	1	methylaminocarbonyl	H
499gu	pyridin-2-ylamino	3	1	adamantan-1-yl	H
499gv	pyridin-2-ylamino	3	1	aminocarbonyl	H
499gw	benzimidazol-2-ylmethylaminocarbon	0	0	adamantan-2-yl	H
499gx	benzimidazol-2-ylmethylaminocarbon	0	0	aminocarbonyl	NHSO ₂ (2,4,6-trimethylphenyl)
499gy	benzimidazol-2-ylmethylaminocarbon	0	0	tetrahydroisoquinol in-2-ylcarbonyl	H
499gz	benzimidazol-2-ylmethylaminocarbon	0	0	H	NHSO ₂ (2,4,6-trichlorophenyl)
				H	NHSO ₂ (2,6-dichlorophenyl)
				H	NHSO ₂ (2-chloro-6-methylphenyl)

499ha	benzimidazol-2-ylmethyloaminocarbon yl	0	0	H	NHSO ₂ C ₆ H ₄ (2-CH ₃)
499hb	benzimidazol-2-ylmethyloaminocarbon yl	0	0	H	NHSO ₂ C ₆ H ₄ (2-Br)
499hc	benzimidazol-2-ylmethyloaminocarbon yl	0	0	H	NHSO ₂ [4- (2,6-dimethylphenyl) phenyl]
499hd	benzimidazol-2-ylmethyloaminocarbon yl	0	0	H	NHSO ₂ C ₆ H ₄ (4-Ph)
499he	benzimidazol-2-ylmethyloaminocarbon yl	0	0	H	NHSO ₂ [4- (3,5-dimethyl) isoxazolyl]
499hf	benzimidazol-2-ylmethyloaminocarbon yl	0	0	H	NHSO ₂ (1-naphthyl)
499hg	benzimidazol-2-ylmethyloaminocarbon yl	0	0	H	NHSO ₂ (2-naphthyl)
499hi	benzimidazol-2-ylmethyloaminocarbon yl	0	0	H	NHSO ₂ NHCH ₂ Ph
499hj	benzimidazol-2-ylmethyloaminocarbon yl	0	0	H	NHSO ₂ NHPh
499hk	benzimidazol-2-ylmethyloaminocarbon yl	0	0	Ph	H
499hl	benzimidazol-2-ylmethyloaminocarbon yl	0	0	phenylsulfonylamino methyl	H
499hm	benzimidazol-2-ylmethyloaminocarbon yl	0	0	3-azabicyclo[3.2.2] nonan-3-ylcarbonyl	H
499hn	benzimidazol-2-ylmethyloaminocarbon yl	0	0	adamantan-1-yl methylaminocarbonyl	H

499ho	benzimidazol-2-ylmethylaminocarbon yl	0	0	adamantan-1-yl aminocarbonyl	H
499hp	benzimidazol-2-ylmethylaminocarbon yl	0	0	adamantan-2-yl aminocarbonyl	H
499hq	benzimidazol-2-ylmethylaminocarbon yl	0	0	tetrahydroisoquinol in-2-ylcarbonyl	H
499hr	N-(benzimidazol-2-ylmethyl)-N-methylaminocarbonyl	0	0	H	NHSO ₂ (2,4,6-trimethylphenyl)
499hs	N-(benzimidazol-2-ylmethyl)-N-methylaminocarbonyl	0	0	H	NHSO ₂ (2,4,6-trichlorophenyl)
499ht	N-(benzimidazol-2-ylmethyl)-N-methylaminocarbonyl	0	0	H	NHSO ₂ (2,6-dichlorophenyl)
499hu	N-(benzimidazol-2-ylmethyl)-N-methylaminocarbonyl	0	0	H	NHSO ₂ (2-chloro-6-methylphenyl)
499hv	N-(benzimidazol-2-ylmethyl)-N-methylaminocarbonyl	0	0	H	NHSO ₂ C ₆ H ₄ (2-CH ₃)
499hw	N-(benzimidazol-2-ylmethyl)-N-methylaminocarbonyl	0	0	H	NHSO ₂ C ₆ H ₄ (2-Br)
499hx	N-(benzimidazol-2-ylmethyl)-N-methylaminocarbonyl	0	0	H	NHSO ₂ [4-(2,6-dimethylphenyl)phenyl]
499hy	N-(benzimidazol-2-ylmethyl)-N-methylaminocarbonyl	0	0	H	NHSO ₂ C ₆ H ₄ (4-Ph)
499hz	N-(benzimidazol-2-ylmethyl)-N-methylaminocarbonyl	0	0	H	NHSO ₂ [4-(3,5-dimethyl)isoxazolyl]
499ia	N-(benzimidazol-2-ylmethyl)-N-methylaminocarbonyl	0	0	H	NHSO ₂ (1-naphthyl)

499ib	N-(benzimidazol-2-ylmethyl)-N-methyl-aminocarbonyl	0	0	H	NHSO ₂ (2-napthyl)
499ic	N-(benzimidazol-2-ylmethyl)-N-methyl-aminocarbonyl	0	0	H	NHSO ₂ NHCH ₂ Ph
499id	N-(benzimidazol-2-ylmethyl)-N-methyl-aminocarbonyl	0	0	H	NHSO ₂ NHPh
499ie	N-(benzimidazol-2-ylmethyl)-N-methyl-aminocarbonyl	0	0	Ph	H
499if	N-(benzimidazol-2-ylmethyl)-N-methyl-aminocarbonyl	0	0	phenylsulfonylamino methyl	H
499ig	N-(benzimidazol-2-ylmethyl)-N-methyl-aminocarbonyl	0	0	3-azabicyclo[3.2.2]nonan-3-ylcarbonyl	H
499ih	N-(benzimidazol-2-ylmethyl)-N-methyl-aminocarbonyl	0	0	adamantan-1-yl methylaminocarbonyl	H
499ii	N-(benzimidazol-2-ylmethyl)-N-methyl-aminocarbonyl	0	0	adamantan-1-yl aminocarbonyl	H
499ij	N-(benzimidazol-2-ylmethyl)-N-methyl-aminocarbonyl	0	0	adamantan-2-yl aminocarbonyl	H
499ik	N-(benzimidazol-2-ylmethyl)-N-methyl-aminocarbonyl	0	0	tetrahydroisoquinol in-2-ylcarbonyl	H

Table 2



Ex. No.	$\overline{R^1-U}$	m	n	$\overline{R^8}$	$\overline{R^9}$	MS
501	tetrahydropyrimidin-2-ylamino	3	1	H	H	
502	tetrahydropyrimidin-2-ylamino	3	1	H	NHCbz	
503	tetrahydropyrimidin-2-ylamino	3	1	H	NHtBOC	
504	tetrahydropyrimidin-2-ylamino	3	1	H	NHCO ₂ -nBu	
505	tetrahydropyrimidin-2-ylamino	3	1	H	NHCO ₂ Et	
506	tetrahydropyrimidin-2-ylamino	3	1	H	NHCO ₂ Me	
507	tetrahydropyrimidin-2-ylamino	3	1	H	NHCO(CH ₂) _n Ph	
508	tetrahydropyrimidin-2-ylamino	3	1	H	NHCOtBu	
509	tetrahydropyrimidin-2-ylamino	3	1	H	NHCO-n-C ₅ H ₁₁	
510	tetrahydropyrimidin-2-ylamino	3	1	H	NHCO-n-C ₄ H ₉	

511	tetrahydropyrimidin -2-ylamino	3	1	H	NHCOCH ₂ CH ₃
512	tetrahydropyrimidin -2-ylamino	3	1	H	NHCOCH ₃
513	tetrahydropyrimidin -2-ylamino	3	1	H	NHSO ₂ CH ₃
514	tetrahydropyrimidin -2-ylamino	3	1	H	NHSO ₂ CH ₂ CH ₃
515	tetrahydropyrimidin -2-ylamino	3	1	H	NHSO ₂ n-Bu
516	tetrahydropyrimidin -2-ylamino	3	1	H	NHSO ₂ Ph
517	tetrahydropyrimidin -2-ylamino	3	1	H	NHSO ₂ C ₆ H ₄ (4-CH ₃)
518	tetrahydropyrimidin -2-ylamino	3	1	H	NHSO ₂ Bn
519	tetrahydropyrimidin -2-ylamino	3	1	H	NHCO (2-pyridyl)
520	tetrahydropyrimidin -2-ylamino	3	1	H	NHCO (3-pyridyl)
521	tetrahydropyrimidin -2-ylamino	3	1	H	NHCO (4-pyridyl)
522	tetrahydropyrimidin -2-ylamino	3	1	H	NHCOCH ₂ (2-pyridyl)
523	tetrahydropyrimidin -2-ylamino	3	1	H	NHCOCH ₂ (3-pyridyl)
524	tetrahydropyrimidin -2-ylamino	3	1	H	NHCOCH ₂ (4-pyridyl)
525	tetrahydropyrimidin -2-ylamino	3	1	H	NHCO ₂ CH ₂ (2-pyridyl)

526	tetrahydropyrimidin -2-ylamino	3	1	H	NHCO ₂ CH ₂ (3-pyridyl)
527	tetrahydropyrimidin -2-ylamino	3	1	H	NHCO ₂ CH ₂ (4-pyridyl)
528	imidazolin-2- ylamino	3	1	H	H
529	imidazolin-2- ylamino	3	1	H	NHCbz
530	imidazolin-2- ylamino	3	1	H	NHtBOC
531	imidazolin-2- ylamino	3	1	H	NHCO ₂ -nBu
532	imidazolin-2- ylamino	3	1	H	NHCO ₂ Et
533	imidazolin-2- ylamino	3	1	H	NHCO ₂ Me
534	imidazolin-2- ylamino	3	1	H	NHCO(CH ₂) _n Ph
535	imidazolin-2- ylamino	3	1	H	NHCotBu
536	imidazolin-2- ylamino	3	1	H	NHCO-n-C ₅ H ₁₁
537	imidazolin-2- ylamino	3	1	H	NHCO-n-C ₄ H ₉
538	imidazolin-2- ylamino	3	1	H	NHCOCH ₂ CH ₃
539	imidazolin-2- ylamino	3	1	H	NHCOCH ₃
540	imidazolin-2- ylamino	3	1	H	NHSO ₂ CH ₃

541	imidazolin-2-ylamino	3	1	H	NHSO ₂ CH ₂ CH ₃
542	imidazolin-2-ylamino	3	1	H	NHSO ₂ n-Bu
543	imidazolin-2-ylamino	3	1	H	NHSO ₂ Ph
544	imidazolin-2-ylamino	3	1	H	NHSO ₂ C ₆ H ₄ (4-CH ₃)
545	imidazolin-2-ylamino	3	1	H	NHSO ₂ Bn
546	imidazolin-2-ylamino	3	1	H	NHCO (2-pyridyl)
547	imidazolin-2-ylamino	3	1	H	NHCO (3-pyridyl)
548	imidazolin-2-ylamino	3	1	H	NHCO (4-pyridyl)
549	imidazolin-2-ylamino	3	1	H	NHCOCH ₂ (2-pyridyl)
550	imidazolin-2-ylamino	3	1	H	NHCOCH ₂ (3-pyridyl)
551	imidazolin-2-ylamino	3	1	H	NHCOCH ₂ (4-pyridyl)
552	imidazolin-2-ylamino	3	1	H	NHCO ₂ CH ₂ (2-pyridyl)
553	imidazolin-2-ylamino	3	1	H	NHCO ₂ CH ₂ (3-pyridyl)
554	imidazolin-2-ylamino	3	1	H	NHCO ₂ CH ₂ (4-pyridyl)
555	tetrahydropyrimidin-2-ylamino	4	0	H	H

556	tetrahydropyrimidin -2-ylamino	4	0	H	NHCbz
557	tetrahydropyrimidin -2-ylamino	4	0	H	NHtBOC
558	tetrahydropyrimidin -2-ylamino	4	0	H	NHCO ₂ -nBu
559	tetrahydropyrimidin -2-ylamino	4	0	H	NHCO ₂ Et
560	tetrahydropyrimidin -2-ylamino	4	0	H	NHCO ₂ Me
561	tetrahydropyrimidin -2-ylamino	4	0	H	NHCO(CH ₂) _n Ph
562	tetrahydropyrimidin -2-ylamino	4	0	H	NHCotBu
563	tetrahydropyrimidin -2-ylamino	4	0	H	NHCO-n-C ₅ H ₁₁
564	tetrahydropyrimidin -2-ylamino	4	0	H	NHCO-n-C ₄ H ₉
565	tetrahydropyrimidin -2-ylamino	4	0	H	NHCOCH ₂ CH ₃
566	tetrahydropyrimidin -2-ylamino	4	0	H	NHCOCH ₃
567	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ CH ₃
568	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ CH ₂ CH ₃
569	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ n-Bu
570	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ Ph

571	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ (4-CH ₃)
572	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ Bn
573	tetrahydropyrimidin -2-ylamino	4	0	H	NHCO (2-pyridyl)
574	tetrahydropyrimidin -2-ylamino	4	0	H	NHCO (3-pyridyl)
575	tetrahydropyrimidin -2-ylamino	4	0	H	NHCO (4-pyridyl)
576	tetrahydropyrimidin -2-ylamino	4	0	H	NHCOCH ₂ (2-pyridyl)
577	tetrahydropyrimidin -2-ylamino	4	0	H	NHCOCH ₂ (3-pyridyl)
578	tetrahydropyrimidin -2-ylamino	4	0	H	NHCOCH ₂ (4-pyridyl)
579	tetrahydropyrimidin -2-ylamino	4	0	H	NHCO ₂ CH ₂ (2-pyridyl)
580	tetrahydropyrimidin -2-ylamino	4	0	H	NHCO ₂ CH ₂ (3-pyridyl)
581	tetrahydropyrimidin -2-ylamino	4	0	H	NHCO ₂ CH ₂ (4-pyridyl)
582	imidazolin-2- ylamino	4	0	H	H
583	imidazolin-2- ylamino	4	0	H	NHCbz
584	imidazolin-2- ylamino	4	0	H	NHtBOC
585	imidazolin-2- ylamino	4	0	H	NHCO ₂ -nBu

475.4

586	imidazolin-2-ylamino	4	0	H	NHCO ₂ Et	
587	imidazolin-2-ylamino	4	0	H	NHCO ₂ Me	
588	imidazolin-2-ylamino	4	0	H	NHCO(CH ₂) _n Ph	
589	imidazolin-2-ylamino	4	0	H	NHCotBu	
590	imidazolin-2-ylamino	4	0	H	NHCO-n-C ₅ H ₁₁	
591	imidazolin-2-ylamino	4	0	H	NHCO-n-C ₄ H ₉	
592	imidazolin-2-ylamino	4	0	H	NHCOCH ₂ CH ₃	
593	imidazolin-2-ylamino	4	0	H	NHCOCH ₃	
594	imidazolin-2-ylamino	4	0	H	NHSO ₂ CH ₃	
595	imidazolin-2-ylamino	4	0	H	NHSO ₂ CH ₂ CH ₃	
596	imidazolin-2-ylamino	4	0	H	NHSO ₂ n-Bu	
597	imidazolin-2-ylamino	4	0	H	NHSO ₂ Ph	481.3
598	imidazolin-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ (4-CH ₃)	
599	imidazolin-2-ylamino	4	0	H	NHSO ₂ Bn	
600	imidazolin-2-ylamino	4	0	H	NHCO(2-pyridyl)	

601	imidazolin-2-ylamino	4	0	H	NHCO(3-pyridyl)
602	imidazolin-2-ylamino	4	0	H	NHCO(4-pyridyl)
603	imidazolin-2-ylamino	4	0	H	NHCOCH ₂ (2-pyridyl)
604	imidazolin-2-ylamino	4	0	H	NHCOCH ₂ (3-pyridyl)
605	imidazolin-2-ylamino	4	0	H	NHCOCH ₂ (4-pyridyl)
606	imidazolin-2-ylamino	4	0	H	NHCOCH ₂ (2-pyridyl)
607	imidazolin-2-ylamino	4	0	H	NHCOCH ₂ (3-pyridyl)
608	imidazolin-2-ylamino	4	0	H	NHCOCH ₂ (4-pyridyl)
609	tetrahydropyrimidin-2-ylamino	3	0	H	H
610	tetrahydropyrimidin-2-ylamino	3	0	H	NHCbz
611	tetrahydropyrimidin-2-ylamino	3	0	H	NHtBOC
612	tetrahydropyrimidin-2-ylamino	3	0	H	NHCO ₂ -nBu
613	tetrahydropyrimidin-2-ylamino	3	0	H	NHCO ₂ Et
614	tetrahydropyrimidin-2-ylamino	3	0	H	NHCO ₂ Me
615	tetrahydropyrimidin-2-ylamino	3	0	H	NHCO(CH ₂) _n Ph

616	tetrahydropyrimidin -2-ylamino	3	0	H	NHCotBu
617	tetrahydropyrimidin -2-ylamino	3	0	H	NHCO-n-C ₅ H ₁₁
618	tetrahydropyrimidin -2-ylamino	3	0	H	NHCO-n-C ₄ H ₉
619	tetrahydropyrimidin -2-ylamino	3	0	H	NHCOCH ₂ CH ₃
620	tetrahydropyrimidin -2-ylamino	3	0	H	NHCOCH ₃
621	tetrahydropyrimidin -2-ylamino	3	0	H	NHSO ₂ CH ₃
622	tetrahydropyrimidin -2-ylamino	3	0	H	NHSO ₂ CH ₂ CH ₃
623	tetrahydropyrimidin -2-ylamino	3	0	H	NHSO ₂ n-Bu
624	tetrahydropyrimidin -2-ylamino	3	0		NHSO ₂ Ph
625	tetrahydropyrimidin -2-ylamino	3	0	H	NHSO ₂ C ₆ H ₄ (4-CH ₃)
626	tetrahydropyrimidin -2-ylamino	3	0	H	NHSO ₂ Bn
627	tetrahydropyrimidin -2-ylamino	3	0	H	NHCO(2-pyridyl)
628	tetrahydropyrimidin -2-ylamino	3	0	H	NHCO(3-pyridyl)
629	tetrahydropyrimidin -2-ylamino	3	0	H	NHCO(4-pyridyl)
630	tetrahydropyrimidin -2-ylamino	3	0	H	NHCOCH ₂ (2-pyridyl)

631	tetrahydropyrimidin -2-ylamino	3	0	H	NHCOCH ₂ (3-pyridyl)
632	tetrahydropyrimidin -2-ylamino	3	0	H	NHCOCH ₂ (4-pyridyl)
633	tetrahydropyrimidin -2-ylamino	3	0	H	NHCOCH ₂ CH ₂ (2-pyridyl)
634	tetrahydropyrimidin -2-ylamino	3	0	H	NHCOCH ₂ CH ₂ (3-pyridyl)
635	tetrahydropyrimidin -2-ylamino	3	0	H	NHCOCH ₂ CH ₂ (4-pyridyl)
636	imidazolin-2- ylamino	3	0	H	H
637	imidazolin-2- ylamino	3	0	H	NHCbz
638	imidazolin-2- ylamino	3	0	H	NHtBOC
639	imidazolin-2- ylamino	3	0	H	NHCO ₂ -nBu
640	imidazolin-2- ylamino	3	0	H	NHCO ₂ Et
641	imidazolin-2- ylamino	3	0	H	NHCO ₂ Me
642	imidazolin-2- ylamino	3	0	H	NHCO(CH ₂) _n Ph
643	imidazolin-2- ylamino	3	0	H	NHCOtBu
644	imidazolin-2- ylamino	3	0	H	NHCO-n-C ₅ H ₁₁
645	imidazolin-2- ylamino	3	0	H	NHCO-n-C ₄ H ₉

461.3

646	imidazolin-2-ylamino	3	0	H	NHCOCH ₂ CH ₃
647	imidazolin-2-ylamino	3	0	H	NHCOCH ₃
648	imidazolin-2-ylamino	3	0	H	NHSO ₂ CH ₃
649	imidazolin-2-ylamino	3	0	H	NHSO ₂ CH ₂ CH ₃
650	imidazolin-2-ylamino	3	0	H	NHSO ₂ n-Bu
651	imidazolin-2-ylamino	3	0	H	NHSO ₂ Ph
652	imidazolin-2-ylamino	3	0	H	NHSO ₂ C ₆ H ₄ (4-CH ₃)
653	imidazolin-2-ylamino	3	0	H	NHSO ₂ Bn
654	imidazolin-2-ylamino	3	0	H	NHCO (2-pyridyl)
655	imidazolin-2-ylamino	3	0	H	NHCO (3-pyridyl)
656	imidazolin-2-ylamino	3	0	H	NHCO (4-pyridyl)
657	imidazolin-2-ylamino	3	0	H	NHCOCH ₂ (2-pyridyl)
658	imidazolin-2-ylamino	3	0	H	NHCOCH ₂ (3-pyridyl)
659	imidazolin-2-ylamino	3	0	H	NHCOCH ₂ (4-pyridyl)
660	imidazolin-2-ylamino	3	0	H	NHCO ₂ CH ₂ (2-pyridyl)

661	imidazolin-2-ylamino	3	0	H	NHCO ₂ CH ₂ (3-pyridyl)	
662	imidazolin-2-ylamino	3	0	H	NHCO ₂ CH ₂ (4-pyridyl)	
663	pyridin-2-ylamino	3	1	H	NHCbz	
664	pyridin-2-ylamino	3	1	H	NHCO ₂ -n-Bu	
665	pyridin-2-ylamino	3	1	H	NHSO ₂ Ph	
666	pyridin-2-ylamino	3	1	H	NHSO ₂ -nBu	
667	pyridin-2-ylamino	4	0	H	NHCbz	484.3
668	pyridin-2-ylamino	4	0	H	NHCO ₂ -n-Bu	
669	pyridin-2-ylamino	4	0	H	NHSO ₂ Ph	490.2
670	pyridin-2-ylamino	4	0	H	NHSO ₂ -nBu	
671	pyridin-2-ylamino	3	0	H	NHCbz	
672	pyridin-2-ylamino	3	0	H	NHCO ₂ -n-Bu	
673	pyridin-2-ylamino	3	0	H	NHSO ₂ Ph	
674	pyridin-2-ylamino	3	0	H	NHSO ₂ -nBu	
675	imidazol-2-ylamino	3	1	H	NHCbz	

676	imidazol-2-ylamino	3	1	H	NHCO ₂ -n-Bu
677	imidazol-2-ylamino	3	1	H	NHSO ₂ Ph
678	imidazol-2-ylamino	3	1	H	NHSO ₂ -nBu
679	imidazol-2-ylamino	4	0	H	NHCbz
680	imidazol-2-ylamino	4	0	H	NHCO ₂ -n-Bu
681	imidazol-2-ylamino	4	0	H	NHSO ₂ Ph
682	imidazol-2-ylamino	4	0	H	NHSO ₂ -nBu
683	imidazol-2-ylamino	3	0	H	NHCbz
684	imidazol-2-ylamino	3	0	H	NHCO ₂ -n-Bu
685	imidazol-2-ylamino	3	0	H	NHSO ₂ Ph
686	imidazol-2-ylamino	3	0	H	NHSO ₂ -nBu
687	thiazol-2-ylamino	3	1	H	NHCbz
688	2-aminopyridin-6-yl	3	1	H	NHCO ₂ -n-Bu
689	2-aminopyridin-6-yl	3	1	H	NHSO ₂ Ph
690	2-aminopyridin-6-yl	3	1	H	NHSO ₂ -nBu

691	2-aminopyridin-6-yl	4	0	H	NHCbz	
692	2-aminopyridin-6-yl	4	0	H	NHCO ₂ -n-Bu	
693	2-aminopyridin-6-yl	4	0	H	NHSO ₂ Ph	
694	2-aminopyridin-6-yl	4	0	H	NHSO ₂ -nBu	
695	2-aminopyridin-6-yl	3	0	H	NHCbz	470.5
696	2-aminopyridin-6-yl	3	0	H	NHCO ₂ -n-Bu	
697	2-aminopyridin-6-yl	3	0	H	NHSO ₂ Ph	476.4
698	2-aminopyridin-6-yl	3	0	H	NHSO ₂ -nBu	
699	2-aminopyridin-3-yl	2	0	H	NHCbz	
700	2-aminopyridin-3-yl	2	0	H	NHCO ₂ -n-Bu	
701	2-aminopyridin-3-yl	2	0	H	NHSO ₂ Ph	
702	2-aminopyridin-3-yl	2	0	H	NHSO ₂ -nBu	
703	2-aminothiazol-4-yl	3	1	H	NHCbz	
704	2-aminothiazol-4-yl	3	1	H	NHCO ₂ -n-Bu	
705	2-aminothiazol-4-yl	3	1	H	NHSO ₂ Ph	

706	2-aminothiazol-4-yl	3	1	H	NHSO ₂ -nBu
707	2-aminothiazol-4-yl	4	0	H	NHCbz
708	2-aminothiazol-4-yl	4	0	H	NHCO ₂ -n-Bu
709	2-aminothiazol-4-yl	4	0	H	NHSO ₂ Ph
710	2-aminopyridin-6-yl	4	0	H	NHSO ₂ -nBu
711	2-aminothiazol-4-yl	3	0	H	NHCbz
712	2-aminothiazol-4-yl	3	0	H	NHCO ₂ -n-Bu
713	2-aminothiazol-4-yl	3	0	H	NHSO ₂ Ph
714	2-aminothiazol-4-yl	3	0	H	NHSO ₂ -nBu
715	2-aminothiazol-4-yl	3	1	H	NHCbz
716	2-aminothiazol-4-yl	3	1	H	NHCO ₂ -n-Bu
775	imidazolin-2-ylamino	2	2	H	NHCbz
776	imidazolin-2-ylamino	2	2	H	NHCO ₂ -n-Bu
777	imidazolin-2-ylamino	2	2	H	NHSO ₂ Ph
778	imidazolin-2-ylamino	2	2	H	NHSO ₂ -nBu

779	tetrahydropyrimidin -2-ylamino	2	2	H	NHCbz
780	tetrahydropyrimidin -2-ylamino	2	2	H	NHCO ₂ -n-Bu
781	tetrahydropyrimidin -2-ylamino	2	2	H	NHSO ₂ Ph
782	tetrahydropyrimidin -2-ylamino	2	2	H	NHSO ₂ -nBu
783	benzimidazol-2- ylamino	4	0	H	NHCbz
784	benzthiazol-2- ylamino	4	0	H	NHCbz
787	imidazol-4-ylamino	4	0	H	NHCbz
794	2-iminopyrrolidin- 5-yl	3	1	H	NHCbz
795	2-iminopyrrolidin- 5-yl	3	1	H	NHSO ₂ Ph
796	2-iminopyrrolidin- 5-yl	3	0	H	NHCbz
797	2-iminopyrrolidin- 5-yl	3	0	H	NHSO ₂ Ph
798	2-iminopyrrolidin- 5-yl	2	1	H	NHCbz
799	2-iminopyrrolidin- 5-yl	2	1	H	NHSO ₂ Ph
800	2-iminopiperidin-6- yl	3	1	H	NHCbz
801	2-iminopiperidin-6- yl	3	1	H	NHSO ₂ Ph

802	2-iminopiperidin-6-yl	3	0	H	NHCbz
803	2-iminopiperidin-6-yl	3	0	H	NHSO ₂ Ph
804	2-iminopiperidin-6-yl	2	1	H	NHCbz
805	2-iminopiperidin-6-yl	2	1	H	NHSO ₂ Ph
806	2-iminoazepin-7-yl	3	1	H	NHCbz
807	2-iminoazepin-7-yl	3	1	H	NHSO ₂ Ph
808	2-iminoazepin-7-yl	3	0	H	NHCbz
809	2-iminoazepin-7-yl	3	0	H	NHSO ₂ Ph
810	2-iminoazepin-7-yl	2	1	H	NHCbz
811	2-iminoazepin-7-yl	2	1	H	NHSO ₂ Ph
812	benzimidazol-2-ylamino	4	0	n-Bu	H
813	benzthiazol-2-ylamino	4	0	n-Bu	H
816	imidazol-4-ylamino	4	0	n-Bu	H
823	imidazolin-2-ylamino	2	0	H	NHCbz
824	imidazolin-2-ylamino	2	0	H	NHSO ₂ Ph

447.4

for

830	pyridin-2-ylamino	4	0	H	N(Me)SO ₂ C ₆ H ₄ - (3-Me)	518.2
831	pyridin-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ - (2-Me)	504.3
832	pyridin-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ - (3-Me)	504.2
833	pyridin-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ - (4-Me)	504.2
834	pyridin-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ - (2-Br)	568.1
835	pyridin-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ - (3-Br)	570.0
836	pyridin-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ - (4-Br)	570.0
837	pyridin-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ - (2-F)	508.2
838	pyridin-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ - (4-F)	508.2
839	pyridin-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ - (2-CF ₃)	558.3
840	pyridin-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ - (3-CF ₃)	558.1
841	pyridin-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ - (4-CF ₃)	
842	pyridin-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ - (4-OCH ₃)	520.1
843	pyridin-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ - (4-CN)	515.2
844	pyridin-2-ylamino	4	0	H	NHSO ₂ [4-(acetylamino)phenyl]	547.3

845	pyridin-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ - (4-OCF ₃)	574.3
846	pyridin-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ - (4-isopropyl)	532.4
847	pyridin-2-ylamino	4	0	H	NHSO ₂ (2,6-dichlorophenyl)	558.3
848	pyridin-2-ylamino	4	0	H	NHSO ₂ (2-chloro-6-methylphenyl)	538.3
849	pyridin-2-ylamino	4	0	H	NHSO ₂ (2,4,6-trimethylphenyl)	532.2
850	pyridin-2-ylamino	4	0	H	NHSO ₂ (2,4,6-triisopropylphenyl)	616.4
851	pyridin-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ - (4-Ph)	566.1
852	pyridin-2-ylamino	4	0	H	NHSO ₂ [4- (2,6-dimethylphenyl) phenyl]	
853	pyridin-2-ylamino	4	0	H	NHSO ₂ (1-naphthyl)	540.1
854	pyridin-2-ylamino	4	0	H	NHSO ₂ (2-naphthyl)	540.3
855	pyridin-2-ylamino	4	0	H	NHSO ₂ (8-quinoliny1)	541.1
856	pyridin-2-ylamino	4	0	H	NHSO ₂ (CH=CH) C ₆ H ₅	516.1
857	pyridin-2-ylamino	4	0	H	NHSO ₂ CH ₂ Ph	504.3
858	pyridin-2-ylamino	4	0	H	NHSO ₂ (2-thienyl)	496.1
859	pyridin-2-ylamino	4	0	H	NHSO ₂ [2- (5-chloro) thienyl]	530.2

860	pyridin-2-ylamino	4	0	H	NHSO ₂ [2-(5-pyridin-2-yl)thienyl]	573.0
861	pyridin-2-ylamino	4	0	H	NHSO ₂ [3-(2-(methoxycarbonyl)thienyl)]	554.1
862	pyridin-2-ylamino	4	0	H	NHSO ₂ [2-(5-isoxazol-3-yl)thienyl]	563.3
863	pyridin-2-ylamino	4	0	H	NHSO ₂ [2-(4-phenylsulfonyl)thienyl]	636.1
864	pyridin-2-ylamino	4	0	H	NHSO ₂ [3-(2-(1-CH ₃ -5-CF ₃ -pyrazol-3-yl))thienyl]	644.0
865	pyridin-2-ylamino	4	0	H	NHSO ₂ [2-(5-(5-CF ₃ -pyridine-2-yl)sulfonyl)thienyl]	705.2
866	pyridin-2-ylamino	4	0	H	NHSO ₂ [2-(5-(5-CF ₃ -3-chloropyridine-2-yl)sulfonyl)thienyl]	739.2
867	pyridin-2-ylamino	4	0	H	NHSO ₂ [2-(4,5-dichloro)thienyl]	564.2
868	pyridin-2-ylamino	4	0	H	NHSO ₂ [2-(3-bromo-5-chloro)thienyl]	610.0
869	pyridin-2-ylamino	4	0	H	NHSO ₂ [3-(2,5-dichloro)thienyl]	564.0
870	pyridin-2-ylamino	4	0	H	NHSO ₂ [4-(1-methyl)imidazolyl]	494.1
871	pyridin-2-ylamino	4	0	H	NHSO ₂ [4-(1,3-dimethyl-5-chloro)pyrazolyl]	542.1
872	pyridin-2-ylamino	4	0	H	NHSO ₂ [4-(3,5-dimethyl)isoxazolyl]	509.2
873	pyridin-2-ylamino	4	0	H	NHSO ₂ NH(cyclohexyl)	

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874	pyridin-2-ylamino	4	0	H	NHSO ₂ NHCH ₂ Ph
875	pyridin-2-ylamino	4	0	H	NHSO ₂ NHPh
876	pyridin-2-ylamino	4	0	H	NHSO ₂ NH(2,6-dichloro) Ph
877	pyridin-2-ylamino	4	0	H	NHSO ₂ NH(2,6-dimethoxy) Ph
878	pyridin-2-ylamino	4	0	H	NHSO ₂ NH(2,4,6-trimethyl)Ph
879	pyridin-2-ylamino	4	0	H	NHSO ₂ NH(4-Ph)Ph
880	pyridin-2-ylamino	4	0	H	NHSO ₂ NH(1-napthyl)
881	pyridin-2-ylamino	4	0	H	NHSO ₂ NH(2-napthyl)
882	pyridin-2-ylamino	4	0	Et	H
883	pyridin-2-ylamino	4	0	Ph	H
884	pyridin-2-ylamino	4	0	3-pyridyl	H
885	pyridin-2-ylamino	4	0	CH ₂ Ph	H
886	pyridin-2-ylamino	4	0	phenylsulfonfylamino methyl	H
887	pyridin-2-ylamino	4	0	3-azabicyclo[3.2.2] nonan-3-ylcarbonyl	H
888	pyridin-2-ylamino	4	0	adamantan-1-yl methylaninocarbonyl	H

412.2

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889	pyridin-2-ylamino	4	0	adamantan-2-yl aminocarbonyl	H	
890	pyridin-2-ylamino	4	0	tetrahydroisoquinol in-2-ylcarbonyl	H	
891	pyridin-2-ylamino	4	0	phenylethylaminocar bonyl	H	
892	pyridin-2-ylamino	4	0	[N-(phenylethyl)N- (methyl)amino]carbo nyl	H	
893	imidazolin-2- ylamino	4	0		H	NHSO ₂ (2,4,6- trimethylphenyl)
894	imidazolin-2- ylamino	4	0		H	NHSO ₂ (2,4,6- trichlorophenyl)
895	imidazolin-2- ylamino	4	0		H	NHSO ₂ (2,6- dichlorophenyl)
896	imidazolin-2- ylamino	4	0		H	NHSO ₂ (2-chloro-6- methylphenyl)
897	imidazolin-2- ylamino	4	0		H	NHSO ₂ C ₆ H ₄ (2-CH ₃)
898	imidazolin-2- ylamino	4	0		H	NHSO ₂ C ₆ H ₄ (2-Br)
899	imidazolin-2- ylamino	4	0		H	NHSO ₂ (4-(2,6- dimethylphenyl)phenyl)
900	imidazolin-2- ylamino	4	0		H	NHSO ₂ C ₆ H ₄ (4-Ph)
901	imidazolin-2- ylamino	4	0		H	NHSO ₂ [4-(3,5- dimethyl)isoxazolyl]
902	imidazolin-2- ylamino	4	0		H	NHSO ₂ (1-naphthyl)
903	imidazolin-2- ylamino	4	0		H	NHSO ₂ (2-naphthyl)

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904	imidazolin-2-ylamino	4	0	H	NHSO ₂ NHCH ₂ Ph
905	imidazolin-2-ylamino	4	0	H	NHSO ₂ NHPh
906	imidazolin-2-ylamino	4	0	Ph	H
907	imidazolin-2-ylamino	4	0	phenylsulfonfylamino methyl	H
908	imidazolin-2-ylamino	4	0	3-azabicyclo[3.2.2] nonan-3-ylcarbonyl	H
909	imidazolin-2-ylamino	4	0	adamantan-1-yl methylaminocarbonyl	H
910	imidazolin-2-ylamino	4	0	adamantan-1-yl aminocarbonyl	H
911	imidazolin-2-ylamino	4	0	adamantan-2-yl aminocarbonyl	H
912	imidazolin-2-ylamino	4	0	tetrahydroisoquinol in-2-ylcarbonyl	H
913	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ (2,4,6-trimethylphenyl)
914	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ (2,4,6-trichlorophenyl)
915	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ (2,6-dichlorophenyl)
916	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ (2-chloro-6-methylphenyl)
917	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ (2-CH ₃)
918	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ (2-Br)

919	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ [4-(2,6- dimethylphenyl)phenyl]
920	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ (4-Ph)
921	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ [4-(3,5- dimethyl)isoxazoly]
922	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ (1-naphthyl)
923	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ (2-naphthyl)
924	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ NHCH ₂ Ph
925	tetrahydropyrimidin -2-ylamino	4	0	H	NHSO ₂ NHPh
926	tetrahydropyrimidin -2-ylamino	4	0	Ph	H
927	tetrahydropyrimidin -2-ylamino	4	0	phenylsulfonlamino methyl	H
928	tetrahydropyrimidin -2-ylamino	4	0	3-azabicyclo[3.2.2] nonan-3-ylcarbonyl	H
929	tetrahydropyrimidin -2-ylamino	4	0	adamantan-1-yl methyaminocarbonyl	H
930	tetrahydropyrimidin -2-ylamino	4	0	adamantan-1-yl aminocarbonyl	H
931	tetrahydropyrimidin -2-ylamino	4	0	adamantan-2-yl aminocarbonyl	H
932	tetrahydropyrimidin -2-ylamino	4	0	tetrahydroisquinol in-2-ylcarbonyl	H
933	imidazol-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ -(2-Me)

934	imidazol-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ - (3-Me)
935	imidazol-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ - (4-Me)
936	imidazol-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ - (2-Br)
937	imidazol-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ - (3-Br)
938	imidazol-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ - (4-Br)
939	imidazol-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ - (2-F)
940	imidazol-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ - (4-F)
941	imidazol-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ - (2-CF ₃)
942	imidazol-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ - (3-CF ₃)
943	imidazol-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ - (4-CF ₃)
944	imidazol-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ - (4-OCH ₃)
945	imidazol-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ - (4-CN)
946	imidazol-2-ylamino	4	0	H	NHSO ₂ [4- (acetylamino)phenyl]
947	imidazol-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ - (4-OCF ₃)
948	imidazol-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ - (4- isopropyl)

949	imidazol-2-ylamino	4	0	H	NHSO ₂ (2,6-dichlorophenyl)	547.2
950	imidazol-2-ylamino	4	0	H	NHSO ₂ (2-chloro-6-methylphenyl)	527.3
951	imidazol-2-ylamino	4	0	H	NHSO ₂ (2,4,6-trimethylphenyl)	521.4
952	imidazol-2-ylamino	4	0	H	NHSO ₂ (2,4,6-triisopropylphenyl)	
953	imidazol-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ -(4-Ph)	
954	imidazol-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ -(3-Ph)	
955	imidazol-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ -(2-Ph)	
956	imidazol-2-ylamino	4	0	H	NHSO ₂ [4-(2,6-dimethylphenyl)phenyl]	
957	imidazol-2-ylamino	4	0	H	NHSO ₂ (1-naphthyl)	529.3
958	imidazol-2-ylamino	4	0	H	NHSO ₂ (2-naphthyl)	
959	imidazol-2-ylamino	4	0	H	NHSO ₂ (8-quinolinylnyl)	
960	imidazol-2-ylamino	4	0	H	NHSO ₂ (CH=CH)C ₆ H ₅	
961	imidazol-2-ylamino	4	0	H	NHSO ₂ CH ₂ Ph	
962	imidazol-2-ylamino	4	0	H	NHSO ₂ (2-thienyl)	
963	imidazol-2-ylamino	4	0	H	NHSO ₂ [2-(5-chloro)thienyl]	

964	imidazol-2-ylamino	4	0	H	NHSO ₂ [2-(5-pyridin-2-yl)thienyl]
965	imidazol-2-ylamino	4	0	H	NHSO ₂ [3-(2-(methoxycarbonyl)thienyl)]
966	imidazol-2-ylamino	4	0	H	NHSO ₂ [2-(5-isoxazol-3-yl)thiophenyl]
967	imidazol-2-ylamino	4	0	H	NHSO ₂ [2-(4-phenylsulfonyl)thienyl]
968	imidazol-2-ylamino	4	0	H	NHSO ₂ [3-(2-(1-CH ₃ -5-CF ₃ -pyrazol-3-yl))thienyl]
969	imidazol-2-ylamino	4	0	H	NHSO ₂ [2-(5-(5-CF ₃ -pyridine-2-yl)sulfonyl)thienyl]
970	imidazol-2-ylamino	4	0	H	NHSO ₂ [2-(5-(5-CF ₃ -chloropyridine-2-yl)sulfonyl)thienyl]
971	imidazol-2-ylamino	4	0	H	NHSO ₂ [2-(4,5-dichloro)thienyl]
972	imidazol-2-ylamino	4	0	H	NHSO ₂ [2-(3-bromo-5-chloro)thienyl]
973	imidazol-2-ylamino	4	0	H	NHSO ₂ [3-(2,5-dichloro)thienyl]
974	imidazol-2-ylamino	4	0	H	NHSO ₂ [4-(1-methyl)imidazolyl]
975	imidazol-2-ylamino	4	0	H	NHSO ₂ [4-(1,3-dimethyl-5-chloro)pyrazolyl]
975	imidazol-2-ylamino	4	0	H	NHSO ₂ [4-(3,5-dimethyl)isoxazolyl]
976	imidazol-2-ylamino	4	0	H	NHSO ₂ NH(cyclohexyl)

498.3

977	imidazol-2-ylamino	4	0	H	NHSO ₂ NHCH ₂ Ph
978	imidazol-2-ylamino	4	0	H	NHSO ₂ NHPh
979	imidazol-2-ylamino	4	0	H	NHSO ₂ NH(2,6-dichloro) Ph
980	imidazol-2-ylamino	4	0	H	NHSO ₂ NH(2,6-dimethoxy) Ph
981	imidazol-2-ylamino	4	0	H	NHSO ₂ NH(2,4,6- trimethyl)Ph
982	imidazol-2-ylamino	4	0	H	NHSO ₂ NH(4-Ph)Ph
983	imidazol-2-ylamino	4	0	H	NHSO ₂ NH(1-naphthyl)
984	imidazol-2-ylamino	4	0	H	NHSO ₂ NH(2-naphthyl)
985	imidazol-2-ylamino	4	0	Et	H
986	imidazol-2-ylamino	4	0	Ph	H
987	imidazol-2-ylamino	4	0	3-pyridyl	H
988	imidazol-2-ylamino	4	0	CH ₂ Ph	H
989	imidazol-2-ylamino	4	0	phenylsulfonylamino methyl	H
990	imidazol-2-ylamino	4	0	3-azabicyclo[3.2.2] nonan-3-ylcarbonyl	H
991	imidazol-2-ylamino	4	0	adamantan-1-yl methylaninocarbonyl	H

992	imidazol-2-ylamino	4	0	adamantan-2-yl aminocarbonyl	H	
993	imidazol-2-ylamino	4	0	tetrahydroisoquinol in-2-ylcarbonyl	H	
994	imidazol-2-ylamino	4	0	phenylethylaminocar bonyl	H	
995	imidazol-2-ylamino	4	0	[N-(phenylethyl)N- (methyl)amino]carbo nyl	H	
996	2-aminoimidazol-4- yl	3	0			NHSO ₂ Ph
997	2-aminoimidazol-4- yl	3	0		H	NHSO ₂ (2,4,6- trimethylphenyl)
998	2-aminoimidazol-4- yl	3	0		H	NHSO ₂ (2,4,6- trichlorophenyl)
999	2-aminoimidazol-4- yl	3	0		H	NHSO ₂ (2,6- dichlorophenyl)
999a	2-aminoimidazol-4- yl	3	0		H	NHSO ₂ (2-chloro-6- methylphenyl)
999b	2-aminoimidazol-4- yl	3	0		H	NHSO ₂ C ₆ H ₄ (2-CH ₃)
999c	2-aminoimidazol-4- yl	3	0		H	NHSO ₂ C ₆ H ₄ (2-Br)
999d	2-aminoimidazol-4- yl	3	0		H	NHSO ₂ [4-(2,6- dimethylphenyl)phenyl]
999e	2-aminoimidazol-4- yl	3	0		H	NHSO ₂ C ₆ H ₄ (4-Ph)
999f	2-aminoimidazol-4- yl	3	0		H	NHSO ₂ [4-(3,5- dimethyl)isoxazolyl]
999g	2-aminoimidazol-4- yl	3	0		H	NHSO ₂ (1-naphthyl)

999h	2-aminoimidazol-4-yl	3	0	H	NHSO ₂ (2-napthyl)
999i	2-aminoimidazol-4-yl	3	0	H	NHSO ₂ NHCH ₂ Ph
999j	2-aminoimidazol-4-yl	3	0	H	NHSO ₂ NHPh
999k	2-aminoimidazol-4-yl	3	0	Ph	H
999l	2-aminoimidazol-4-yl	3	0	phenylsulfonylamino methyl	H
999m	2-aminoimidazol-4-yl	3	0	3-azabicyclo[3.2.2] nonan-3-ylcarbonyl	H
999n	2-aminoimidazol-4-yl	3	0	adamantan-1-yl methylaminocarbonyl	H
999o	2-aminoimidazol-4-yl	3	0	adamantan-1-yl aminocarbonyl	H
999p	2-aminoimidazol-4-yl	3	0	adamantan-2-yl aminocarbonyl	H
999q	2-aminoimidazol-4-yl	3	0	tetrahydroisoquinol in-2-ylcarbonyl	H
999r	benzylimidazol-2-yl	4	0	H	NHSO ₂ Ph
999s	benzylimidazol-2-yl	4	0	H	NHSO ₂ (2,4,6-trimethylphenyl)
999t	benzylimidazol-2-yl	4	0	H	NHSO ₂ (2,4,6-trichlorophenyl)
999u	benzylimidazol-2-yl	4	0	H	NHSO ₂ (2,6-dichlorophenyl)
999v	benzylimidazol-2-yl	4	0	H	NHSO ₂ (2-chloro-6-methylphenyl)

999w	benzylimidazol-2-yl	4	0	H	NHSO ₂ C ₆ H ₄ (2-CH ₃)
999x	benzylimidazol-2-yl	4	0	H	NHSO ₂ C ₆ H ₄ (2-Br)
999y	benzylimidazol-2-yl	4	0	H	NHSO ₂ [4- (2,6-dimethylphenyl) phenyl]
999z	benzylimidazol-2-yl	4	0	H	NHSO ₂ C ₆ H ₄ (4-Ph)
999aa	benzylimidazol-2-yl	4	0	H	NHSO ₂ [4- (3,5-dimethyl) isoxazolyl]
999ab	benzylimidazol-2-yl	4	0	H	NHSO ₂ (1-naphthyl)
999ac	benzylimidazol-2-yl	4	0	H	NHSO ₂ (2-naphthyl)
999ad	benzylimidazol-2-yl	4	0	H	NHSO ₂ NHCH ₂ Ph
999ae	benzylimidazol-2-yl	4	0	H	NHSO ₂ NHPh
999af	benzylimidazol-2-yl	4	0	Ph	H
999ag	benzylimidazol-2-yl	4	0	phenylsulfonylamino methyl	H
999ah	benzylimidazol-2-yl	4	0	3-azabicyclo[3.2.2] nonan-3-ylcarbonyl	H
999ai	benzylimidazol-2-yl	4	0	adamantan-1-yl methylaminocarbonyl	H
999aj	benzylimidazol-2-yl	4	0	adamantan-1-yl aminocarbonyl	H
999ak	benzylimidazol-2-yl	4	0	adamantan-2-yl aminocarbonyl	H

999al	benzylimidazol-2-yl	4	0	tetrahydroisoquinol in-2-ylcarbonyl	H
999am	4-methylimidazol-2-ylamino	4	0		H NHSO ₂ Ph
999an	4-methylimidazol-2-ylamino	4	0		H NHSO ₂ (2,4,6-trimethylphenyl)
999ao	4-methylimidazol-2-ylamino	4	0		H NHSO ₂ (2,4,6-trichlorophenyl)
999ap	4-methylimidazol-2-ylamino	4	0		H NHSO ₂ (2,6-dichlorophenyl)
999aq	4-methylimidazol-2-ylamino	4	0		H NHSO ₂ (2-chloro-6-methylphenyl)
999ar	4-methylimidazol-2-ylamino	4	0		H NHSO ₂ C ₆ H ₄ (2-CH ₃)
999as	4-methylimidazol-2-ylamino	4	0		H NHSO ₂ C ₆ H ₄ (2-Br)
999at	4-methylimidazol-2-ylamino	4	0		H NHSO ₂ [4-(2,6-dimethylphenyl)phenyl]
999au	4-methylimidazol-2-ylamino	4	0		H NHSO ₂ C ₆ H ₄ (4-Ph)
999av	4-methylimidazol-2-ylamino	4	0		H NHSO ₂ [4-(3,5-dimethylisoxazolyl)]
999aw	4-methylimidazol-2-ylamino	4	0		H NHSO ₂ (1-naphthyl)
999ax	4-methylimidazol-2-ylamino	4	0		H NHSO ₂ (2-naphthyl)
999az	4-methylimidazol-2-ylamino	4	0		H NHSO ₂ NHCH ₂ Ph
999ba	4-methylimidazol-2-ylamino	4	0		H NHSO ₂ NHPh

999bb	4-methylimidazol-2-ylamino	4	0	Ph	H
999bc	4-methylimidazol-2-ylamino	4	0	phenylsulfonylamino methyl	H
999bd	4-methylimidazol-2-ylamino	4	0	3-azabicyclo[3.2.2]nonan-3-ylcarbonyl	H
999be	4-methylimidazol-2-ylamino	4	0	adamantan-1-yl methylaminocarbonyl	H
999bf	4-methylimidazol-2-ylamino	4	0	adamantan-1-yl aminocarbonyl	H
999bg	4-methylimidazol-2-ylamino	4	0	adamantan-2-yl aminocarbonyl	H
999bh	4-methylimidazol-2-ylamino	4	0	tetrahydroisoquinol in-2-ylcarbonyl	H
999bi	4,5-dimethylimidazol-2-ylamino	4	0	H	NHSO ₂ Ph
999bj	4,5-dimethylimidazol-2-ylamino	4	0	H	NHSO ₂ (2,4,6-trimethylphenyl)
999bk	4,5-dimethylimidazol-2-ylamino	4	0	H	NHSO ₂ (2,4,6-trichlorophenyl)
999bl	4,5-dimethylimidazol-2-ylamino	4	0	H	NHSO ₂ (2,6-dichlorophenyl)
999bm	4,5-dimethylimidazol-2-ylamino	4	0	H	NHSO ₂ (2-chloro-6-methylphenyl)
999bn	4,5-dimethylimidazol-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ (2-CH ₃)
999bo	4,5-dimethylimidazol-2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ (2-Br)

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999bp	4,5- dimethylimidazol-2- ylamino	4	0	H	NHSO ₂ [4-(2,6- dimethylphenyl)phenyl]
999bq	4,5- dimethylimidazol-2- ylamino	4	0	H	NHSO ₂ C ₆ H ₄ (4-Ph)
999br	4,5- dimethylimidazol-2- ylamino	4	0	H	NHSO ₂ [4-(3,5- dimethyl)isoxazolyl]
999bs	4,5- dimethylimidazol-2- ylamino	4	0	H	NHSO ₂ (1-napthyl)
999bt	4,5- dimethylimidazol-2- ylamino	4	0	H	NHSO ₂ (2-napthyl)
999bu	4,5- dimethylimidazol-2- ylamino	4	0	H	NHSO ₂ NHCH ₂ Ph
999bv	4,5- dimethylimidazol-2- ylamino	4	0	H	NHSO ₂ NHPh
999bw	4,5- dimethylimidazol-2- ylamino	4	0	Ph	H
999bx	4,5- dimethylimidazol-2- ylamino	4	0	phenylsulfonfylamino methyl	H
999by	4,5- dimethylimidazol-2- ylamino	4	0	3-azabicyclo[3.2.2] nonan-3-ylcarbonyl	H
999bz	4,5- dimethylimidazol-2- ylamino	4	0	adamantan-1-yl methyaminocarbonyl	H
999ca	4,5- dimethylimidazol-2- ylamino	4	0	adamantan-1-yl aminocarbonyl	H
999cb	4,5- dimethylimidazol-2- ylamino	4	0	adamantan-2-yl aminocarbonyl	H

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999cc	4,5-dimethylimidazol-2-ylamino	4	0	tetrahydroisoquinol in-2-ylcarbonyl	H
999cd	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	4	0		NHSO ₂ Ph
999ce	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	4	0		NHSO ₂ (2,4,6-trimethylphenyl)
999cf	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	4	0		NHSO ₂ (2,4,6-trichlorophenyl)
999cg	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	4	0		NHSO ₂ (2,6-dichlorophenyl)
999ch	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	4	0		NHSO ₂ (2-chloro-6-methylphenyl)
999ci	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	4	0		NHSO ₂ C ₆ H ₄ (2-CH ₃)
999cj	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	4	0		NHSO ₂ C ₆ H ₄ (2-Br)
999ck	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	4	0		NHSO ₂ [4-(2,6-dimethylphenyl)phenyl]
999cl	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	4	0		NHSO ₂ C ₆ H ₄ (4-Ph)
999cm	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	4	0		NHSO ₂ [4-(3,5-dimethyl)isoxazolyl]
999cn	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	4	0		NHSO ₂ (1-naphthyl)
999co	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	4	0		NHSO ₂ (2-naphthyl)

999cp	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	4	0	H	NHSO ₂ NHCH ₂ Ph
999cq	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	4	0	H	NHSO ₂ NHPh
999cr	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	4	0	Ph	H
999cs	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	4	0	phenylsulfonylamino methyl	H
999ct	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	4	0	3-azabicyclo[3.2.2]nonan-3-ylcarbonyl	H
999cu	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	4	0	adamantan-1-yl methylaminocarbonyl	H
999cv	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	4	0	adamantan-1-yl aminocarbonyl	H
999cw	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	4	0	adamantan-2-yl aminocarbonyl	H
999cx	4,5,6,7-tetrahydrobenzimidazol-2-ylamino	4	0	tetrahydroisoquinolin-2-ylcarbonyl	H
999cy	2-aminopyridin-6-yl	3	0	H	NHSO ₂ (2,4,6-trimethylphenyl)
999cz	2-aminopyridin-6-yl	3	0	H	NHSO ₂ (2,4,6-trichlorophenyl)
999da	2-aminopyridin-6-yl	3	0	H	NHSO ₂ (2,6-dichlorophenyl)
999db	2-aminopyridin-6-yl	3	0	H	NHSO ₂ (2-chloro-6-methylphenyl)
999dc	2-aminopyridin-6-yl	3	0	H	NHSO ₂ C ₆ H ₄ (2-CH ₃)

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999de	2-aminopyridin-6-yl	3	0	H	NHSO ₂ C ₆ H ₄ (2-Br)
999df	2-aminopyridin-6-yl	3	0	H	NHSO ₂ [4-(2,6-dimethylphenyl)phenyl]
999dg	2-aminopyridin-6-yl	3	0	H	NHSO ₂ C ₆ H ₄ (4-Ph)
999dh	2-aminopyridin-6-yl	3	0	H	NHSO ₂ [4-(3,5-dimethyl)isoxazolyl]
999di	2-aminopyridin-6-yl	3	0	H	NHSO ₂ (1-naphthyl)
999dj	2-aminopyridin-6-yl	3	0	H	NHSO ₂ (2-naphthyl)
999dk	2-aminopyridin-6-yl	3	0	H	NHSO ₂ NHCH ₂ Ph
999dl	2-aminopyridin-6-yl	3	0	H	NHSO ₂ NHPh
999dm	2-aminopyridin-6-yl	3	0	Ph	H
999dn	2-aminopyridin-6-yl	3	0	phenylsulfonylamino methyl	H
999do	2-aminopyridin-6-yl	3	0	3-azabicyclo [3.2.2] nonan-3-ylcarbonyl	H
999dp	2-aminopyridin-6-yl	3	0	adamantan-1-yl methylaminocarbonyl	H
999dq	2-aminopyridin-6-yl	3	0	adamantan-1-yl aminocarbonyl	H
999dr	2-aminopyridin-6-yl	3	0	adamantan-2-yl aminocarbonyl	H
999ds	2-aminopyridin-6-yl	3	0	tetrahydroisoquinol in-2-ylcarbonyl	H

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999dt	imidazol-2-ylamino	3	0	H	NHSO ₂ (2,4,6-trimethylphenyl)
999du	imidazol-2-ylamino	3	0	H	NHSO ₂ (2,4,6-trichlorophenyl)
999dv	imidazol-2-ylamino	3	0	H	NHSO ₂ (2,6-dichlorophenyl)
999dw	imidazol-2-ylamino	3	0	H	NHSO ₂ (2-chloro-6-methylphenyl)
999dx	imidazol-2-ylamino	3	0	H	NHSO ₂ C ₆ H ₄ (2-CH ₃)
999dy	imidazol-2-ylamino	3	0	H	NHSO ₂ C ₆ H ₄ (2-Br)
999dz	imidazol-2-ylamino	3	0	H	NHSO ₂ [4-(2,6-dimethylphenyl)phenyl]
999ea	imidazol-2-ylamino	3	0	H	NHSO ₂ C ₆ H ₄ (4-Ph)
999eb	imidazol-2-ylamino	3	0	H	NHSO ₂ [4-(3,5-dimethyl)isoxazolyl]
999ef	imidazol-2-ylamino	3	0	H	NHSO ₂ (1-naphthyl)
999eg	imidazol-2-ylamino	3	0	H	NHSO ₂ (2-naphthyl)
999eh	imidazol-2-ylamino	3	0	H	NHSO ₂ NHCH ₂ Ph
999ei	imidazol-2-ylamino	3	0	H	NHSO ₂ NHPh
999ej	imidazol-2-ylamino	3	0	Ph	H
999ek	imidazol-2-ylamino	3	0	phenylsulfonylamino methyl	H

999el	imidazol-2-ylamino	3	0	3-azabicyclo[3.2.2] nonan-3-ylcarbonyl	H	
999em	imidazol-2-ylamino	3	0	adamantan-1-yl methylaminocarbonyl	H	
999en	imidazol-2-ylamino	3	0	adamantan-1-yl aminocarbonyl	H	
999eo	imidazol-2-ylamino	3	0	adamantan-2-yl aminocarbonyl	H	
999ep	imidazol-2-ylamino	3	0	tetrahydroisoquinol in-2-ylcarbonyl	H	
999eq	imidazol-2-ylamino	2	0	H		NHSO ₂ (2,4,6-trimethylphenyl)
999er	imidazol-2-ylamino	2	0	H		NHSO ₂ (2,4,6-trichlorophenyl)
999es	imidazol-2-ylamino	2	0	H		NHSO ₂ (2,6-dichlorophenyl)
999et	imidazol-2-ylamino	2	0	H		NHSO ₂ (2-chloro-6-methylphenyl)
999eu	imidazol-2-ylamino	2	0	H		NHSO ₂ C ₆ H ₄ (2-CH ₃)
999ev	imidazol-2-ylamino	2	0	H		NHSO ₂ C ₆ H ₄ (2-Br)
999ew	imidazol-2-ylamino	2	0	H		NHSO ₂ [4-(2,6-dimethylphenyl)phenyl]
999ex	imidazol-2-ylamino	2	0	H		NHSO ₂ C ₆ H ₄ (4-Ph)
999ey	imidazol-2-ylamino	2	0	H		NHSO ₂ [4-(3,5-dimethyl)isoxazolyl]
999ez	imidazol-2-ylamino	2	0	H		NHSO ₂ (1-naphthyl)

999fa	imidazol-2-ylamino	2	0	H	NHSO ₂ (2-napthyl)
999fb	imidazol-2-ylamino	2	0	H	NHSO ₂ NHCH ₂ Ph
999fc	imidazol-2-ylamino	2	0	H	NHSO ₂ NHPh
999fd	imidazol-2-ylamino	2	0	Ph	H
999fe	imidazol-2-ylamino	2	0	phenylsulfonfylamino methyl	H
999ff	imidazol-2-ylamino	2	0	3-azabicyclo[3.2.2] nonan-3-ylcarbonyl	H
999fg	imidazol-2-ylamino	2	0	adamantan-1-yl methylaminocarbonyl	H
999fh	imidazol-2-ylamino	2	0	adamantan-1-yl aminocarbonyl	H
999fi	imidazol-2-ylamino	2	0	adamantan-2-yl aminocarbonyl	H
999fj	imidazol-2-ylamino	2	0	tetrahydroisoquinol in-2-ylcarbonyl	H
999fk	2-aminoimidazol-4- yl	2	0	H	NHSO ₂ Ph
999fl	2-aminoimidazol-4- yl	2	0	H	NHSO ₂ (2,4,6- trimethylphenyl)
999fm	2-aminoimidazol-4- yl	2	0	H	NHSO ₂ (2,4,6- trichlorophenyl)
999fn	2-aminoimidazol-4- yl	2	0	H	NHSO ₂ (2,6- dichlorophenyl)
999fo	2-aminoimidazol-4- yl	2	0	H	NHSO ₂ (2-chloro-6- methylphenyl)

999fp	2-aminoimidazol-4-yl	2	0	H	NHSO ₂ C ₆ H ₄ (2-CH ₃)
999fq	2-aminoimidazol-4-yl	2	0	H	NHSO ₂ C ₆ H ₄ (2-Br)
999fr	2-aminoimidazol-4-yl	2	0	H	NHSO ₂ [4-(2,6-dimethylphenyl)phenyl]
999fs	2-aminoimidazol-4-yl	2	0	H	NHSO ₂ C ₆ H ₄ (4-Ph)
999ft	2-aminoimidazol-4-yl	2	0	H	NHSO ₂ [4-(3,5-dimethyl)isoxazolyl]
999fu	2-aminoimidazol-4-yl	2	0	H	NHSO ₂ (1-naphthyl)
999fv	2-aminoimidazol-4-yl	2	0	H	NHSO ₂ (2-naphthyl)
999fw	2-aminoimidazol-4-yl	2	0	H	NHSO ₂ NHCH ₂ Ph
999fx	2-aminoimidazol-4-yl	2	0	H	NHSO ₂ NHPh
999fy	2-aminoimidazol-4-yl	2	0	Ph	H
999fz	2-aminoimidazol-4-yl	2	0	phenylsulfonamino methyl	H
999ga	2-aminoimidazol-4-yl	2	0	3-azabicyclo[3.2.2]nonan-3-ylcarbonyl	H
999gb	2-aminoimidazol-4-yl	2	0	adamantan-1-yl	H
999gc	2-aminoimidazol-4-yl	2	0	methylaminocarbonyl	H
999gd	2-aminoimidazol-4-yl	2	0	adamantan-1-yl	H
				aminocarbonyl	
				adamantan-2-yl	H
				aminocarbonyl	

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999ge	2-aminoimidazol-4-yl	2	0	tetrahydroisoquinol in-2-ylcarbonyl	H	NHSO ₂ Ph
999gf	2-aminoimidazol-4-yl	1	0		H	
999gg	2-aminoimidazol-4-yl	1	0		H	NHSO ₂ (2,4,6-trimethylphenyl)
999gh	2-aminoimidazol-4-yl	1	0		H	NHSO ₂ (2,4,6-trichlorophenyl)
999gi	2-aminoimidazol-4-yl	1	0		H	NHSO ₂ (2,6-dichlorophenyl)
999gj	2-aminoimidazol-4-yl	1	0		H	NHSO ₂ (2-chloro-6-methylphenyl)
999gk	2-aminoimidazol-4-yl	1	0		H	NHSO ₂ C ₆ H ₄ (2-CH ₃)
999gl	2-aminoimidazol-4-yl	1	0		H	NHSO ₂ C ₆ H ₄ (2-Br)
999gm	2-aminoimidazol-4-yl	1	0		H	NHSO ₂ [4-(2,6-dimethylphenyl)phenyl]
999gn	2-aminoimidazol-4-yl	1	0		H	NHSO ₂ C ₆ H ₄ (4-Ph)
999go	2-aminoimidazol-4-yl	1	0		H	NHSO ₂ [4-(3,5-dimethyl)isoxazolyl]
999gp	2-aminoimidazol-4-yl	1	0		H	NHSO ₂ (1-naphthyl)
999gq	2-aminoimidazol-4-yl	1	0		H	NHSO ₂ (2-naphthyl)
999gr	2-aminoimidazol-4-yl	1	0		H	NHSO ₂ NHCH ₂ Ph
999gs	2-aminoimidazol-4-yl	1	0		H	NHSO ₂ NHPh

999gt	2-aminoimidazol-4-yl	1	0	Ph	H
999gu	2-aminoimidazol-4-yl		0	phenylsulfonfylamino methyl	H
999gv	2-aminoimidazol-4-yl		0	3-azabicyclo[3.2.2]nonan-3-ylcarbonyl	H
999gw	2-aminoimidazol-4-yl		0	adamantan-1-yl methylaminocarbonyl	H
999gx	2-aminoimidazol-4-yl		0	adamantan-1-yl aminocarbonyl	H
999gy	2-aminoimidazol-4-yl		0	adamantan-2-yl aminocarbonyl	H
999gz	2-aminoimidazol-4-yl		0	tetrahydroisoquinol in-2-ylcarbonyl	H
999ha	imidazol-2-ylaminocarbonyl	3	0	H	NHSO ₂ (2,4,6-trimethylphenyl)
999hb	imidazol-2-ylaminocarbonyl	3	0	H	NHSO ₂ (2,4,6-trichlorophenyl)
999hc	imidazol-2-ylaminocarbonyl	3	0	H	NHSO ₂ (2,6-dichlorophenyl)
999hd	imidazol-2-ylaminocarbonyl	3	0	H	NHSO ₂ (2-chloro-6-methylphenyl)
999he	imidazol-2-ylaminocarbonyl	3	0	H	NHSO ₂ C ₆ H ₄ (2-CH ₃)
999hf	imidazol-2-ylaminocarbonyl	3	0	H	NHSO ₂ C ₆ H ₄ (2-Br)
999hg	imidazol-2-ylaminocarbonyl	3	0	H	NHSO ₂ [4-(2,6-dimethylphenyl)phenyl]
999hh	imidazol-2-ylaminocarbonyl	3	0	H	NHSO ₂ C ₆ H ₄ (4-Ph)

999hi	imidazol-2-ylaminocarbonyl	3	0	H	NHSO ₂ [4-(3,5-dimethyl)isoxazolyl]
999hj	imidazol-2-ylaminocarbonyl	3	0	H	NHSO ₂ (1-naphthyl)
999hk	imidazol-2-ylaminocarbonyl	3	0	H	NHSO ₂ (2-naphthyl)
999hl	imidazol-2-ylaminocarbonyl	3	0	H	NHSO ₂ NHCH ₂ Ph
999hm	imidazol-2-ylaminocarbonyl	3	0	H	NHSO ₂ NHPh
999hn	imidazol-2-ylaminocarbonyl	3	0	Ph	H
999ho	imidazol-2-ylaminocarbonyl	3	0	phenylsulfonylamino methyl	H
999hp	imidazol-2-ylaminocarbonyl	3	0	3-azabicyclo[3.2.2]nonan-3-ylcarbonyl	H
999hq	imidazol-2-ylaminocarbonyl	3	0	adamantan-1-yl methylaminocarbonyl	H
999hr	imidazol-2-ylaminocarbonyl	3	0	adamantan-1-yl aminocarbonyl	H
999hs	imidazol-2-ylaminocarbonyl	3	0	adamantan-2-yl aminocarbonyl	H
999ht	imidazol-2-ylaminocarbonyl	3	0	tetrahydroisoquinol in-2-ylcarbonyl	H
999hu	benzimidazol-2-ylmethyaminocarbon yl	0	0	H	NHSO ₂ Ph
999hv	benzimidazol-2-ylmethyaminocarbon yl	0	0	H	NHSO ₂ (2,4,6-trimethylphenyl)
999hw	benzimidazol-2-ylmethyaminocarbon yl	0	0	H	NHSO ₂ (2,4,6-trichlorophenyl)

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999hx	benzimidazol-2-ylmethylaminocarbon yl	0	0	H	NHSO ₂ (2,6-dichlorophenyl)
999hy	benzimidazol-2-ylmethylaminocarbon yl	0	0	H	NHSO ₂ (2-chloro-6-methylphenyl)
999hz	benzimidazol-2-ylmethylaminocarbon yl	0	0	H	NHSO ₂ C ₆ H ₄ (2-CH ₃)
999ia	benzimidazol-2-ylmethylaminocarbon yl	0	0	H	NHSO ₂ C ₆ H ₄ (2-Br)
999ib	benzimidazol-2-ylmethylaminocarbon yl	0	0	H	NHSO ₂ [4-(2,6-dimethylphenyl)phenyl]
999ic	benzimidazol-2-ylmethylaminocarbon yl	0	0	H	NHSO ₂ C ₆ H ₄ (4-Ph)
999id	benzimidazol-2-ylmethylaminocarbon yl	0	0	H	NHSO ₂ [4-(3,5-dimethyl)isoxazolyl]
999ie	benzimidazol-2-ylmethylaminocarbon yl	0	0	H	NHSO ₂ (1-naphthyl)
999if	benzimidazol-2-ylmethylaminocarbon yl	0	0	H	NHSO ₂ (2-naphthyl)
999ig	benzimidazol-2-ylmethylaminocarbon yl	0	0	H	NHSO ₂ NHCH ₂ Ph
999ih	benzimidazol-2-ylmethylaminocarbon yl	0	0	H	NHSO ₂ NHPh
999ii	benzimidazol-2-ylmethylaminocarbon yl	0	0	Ph	H
999ij	benzimidazol-2-ylmethylaminocarbon yl	0	0	phenylsulfonylamino methyl	H

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999ik	benzimidazol-2-ylmethylaminocarbon y1	0	0	3-azabicyclo[3.2.2]nonan-3-ylcarbonyl	H
999il	benzimidazol-2-ylmethylaminocarbon y1	0	0	adamantan-1-ylmethylaminocarbon y1	H
999im	benzimidazol-2-ylmethylaminocarbon y1	0	0	adamantan-1-ylaminocarbon y1	H
999in	benzimidazol-2-ylmethylaminocarbon y1	0	0	adamantan-2-ylaminocarbon y1	H
999io	benzimidazol-2-ylmethylaminocarbon y1	0	0	tetrahydroisoquinolin-2-ylcarbonyl	H
999ip	N-(benzimidazol-2-ylmethyl)-N-methylaminocarbon y1	0	0	H	NHSO ₂ Ph
999iq	N-(benzimidazol-2-ylmethyl)-N-methylaminocarbon y1	0	0	H	NHSO ₂ (2,4,6-trimethylphenyl)
999ir	N-(benzimidazol-2-ylmethyl)-N-methylaminocarbon y1	0	0	H	NHSO ₂ (2,4,6-trichlorophenyl)
999is	N-(benzimidazol-2-ylmethyl)-N-methylaminocarbon y1	0	0	H	NHSO ₂ (2,6-dichlorophenyl)
999it	N-(benzimidazol-2-ylmethyl)-N-methylaminocarbon y1	0	0	H	NHSO ₂ (2-chloro-6-methylphenyl)
999iu	N-(benzimidazol-2-ylmethyl)-N-methylaminocarbon y1	0	0	H	NHSO ₂ C ₆ H ₄ (2-CH ₃)
999iv	N-(benzimidazol-2-ylmethyl)-N-methylaminocarbon y1	0	0	H	NHSO ₂ C ₆ H ₄ (2-Br)
999iw	N-(benzimidazol-2-ylmethyl)-N-methylaminocarbon y1	0	0	H	NHSO ₂ [4-(2,6-dimethylphenyl)phenyl]

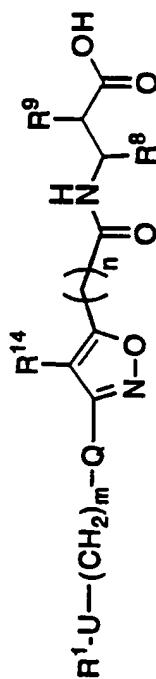
999ix	N-(benzimidazol-2-ylmethyl)-N-methyl-aminocarbonyl	0	0	H	NHSO ₂ C ₆ H ₄ (4-Ph)
999iy	N-(benzimidazol-2-ylmethyl)-N-methyl-aminocarbonyl	0	0	H	NHSO ₂ [4-(3,5-dimethyl)isoxazolyl]
999iz	N-(benzimidazol-2-ylmethyl)-N-methyl-aminocarbonyl	0	0	H	NHSO ₂ (1-naphthyl)
999ja	N-(benzimidazol-2-ylmethyl)-N-methyl-aminocarbonyl	0	0	H	NHSO ₂ (2-naphthyl)
999jb	N-(benzimidazol-2-ylmethyl)-N-methyl-aminocarbonyl	0	0	H	NHSO ₂ NHCH ₂ Ph
999jc	N-(benzimidazol-2-ylmethyl)-N-methyl-aminocarbonyl	0	0	H	NHSO ₂ NHPh
999jd	N-(benzimidazol-2-ylmethyl)-N-methyl-aminocarbonyl	0	0	Ph	H
999je	N-(benzimidazol-2-ylmethyl)-N-methyl-aminocarbonyl	0	0	phenylsulfonylamino methyl	H
999jf	N-(benzimidazol-2-ylmethyl)-N-methyl-aminocarbonyl	0	0	3-azabicyclo[3.2.2]nonan-3-ylcarbonyl	H
999jg	N-(benzimidazol-2-ylmethyl)-N-methyl-aminocarbonyl	0	0	adamantan-1-yl methylaminocarbonyl	H
999jh	N-(benzimidazol-2-ylmethyl)-N-methyl-aminocarbonyl	0	0	adamantan-1-yl aminocarbonyl	H
999ji	N-(benzimidazol-2-ylmethyl)-N-methyl-aminocarbonyl	0	0	adamantan-2-yl aminocarbonyl	H
999jj	N-(benzimidazol-2-ylmethyl)-N-methyl-aminocarbonyl	0	0	tetrahydroisoquinolin-2-ylcarbonyl	H

999jk	3,4,5,6,- tetrahydropyridin- 2-ylamino	4	0	H	NHSO ₂ Ph	494.3
999jl	3,4,5,6,- tetrahydropyridin- 2-ylamino	4	0	H	NHSO ₂ (2,4,6- trimethylphenyl)	536.5
999jm	3,4,5,6,- tetrahydropyridin- 2-ylamino	4	0	H	NHSO ₂ (2,4,6- trichlorophenyl)	
999jn	3,4,5,6,- tetrahydropyridin- 2-ylamino	4	0	H	NHSO ₂ (2,6- dichlorophenyl)	
999jo	3,4,5,6,- tetrahydropyridin- 2-ylamino	4	0	H	NHSO ₂ (2-chloro-6- methylphenyl)	
999jp	3,4,5,6,- tetrahydropyridin- 2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ (2-CH ₃)	
999jq	3,4,5,6,- tetrahydropyridin- 2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ (2-Br)	
999jr	3,4,5,6,- tetrahydropyridin- 2-ylamino	4	0	H	NHSO ₂ [4-(2,6- dimethylphenyl)phenyl]	
999js	3,4,5,6,- tetrahydropyridin- 2-ylamino	4	0	H	NHSO ₂ C ₆ H ₄ (4-Ph)	
999jt	3,4,5,6,- tetrahydropyridin- 2-ylamino	4	0	H	NHSO ₂ [4-(3,5- dimethyl)isoxazolyl]	
999ju	3,4,5,6,- tetrahydropyridin- 2-ylamino	4	0	H	NHSO ₂ (1-naphthyl)	
999jv	3,4,5,6,- tetrahydropyridin- 2-ylamino	4	0	H	NHSO ₂ (2-naphthyl)	
999jw	3,4,5,6,- tetrahydropyridin- 2-ylamino	4	0	H	NHSO ₂ NHCH ₂ Ph	

999jx	3,4,5,6,- tetrahydropyridin- 2-ylamino	4	0	H	NHSO ₂ NHPh
999jy	3,4,5,6,- tetrahydropyridin- 2-ylamino	4	0	Ph	H
999jz	3,4,5,6,- tetrahydropyridin- 2-ylamino	4	0	phenylsulfonylamino methyl	H
999ka	3,4,5,6,- tetrahydropyridin- 2-ylamino	4	0	3-azabicyclo[3.2.2] nonan-3-ylcarbonyl	H
999kb	3,4,5,6,- tetrahydropyridin- 2-ylamino	4	0	adamantan-1-yl methyaminocarbonyl	H
999kc	3,4,5,6,- tetrahydropyridin- 2-ylamino	4	0	adamantan-1-yl aminocarbonyl	H
999kd	3,4,5,6,- tetrahydropyridin- 2-ylamino	4	0	adamantan-2-yl aminocarbonyl	H
999ke	3,4,5,6,- tetrahydropyridin- 2-ylamino	4	0	tetrahydroisquinol in-2-ylcarbonyl	H

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Table 3



Ex. No.	R ¹ -U	m	n	Q	R ⁸	R ⁹	R ¹⁴	MS
1001	imidazolin-2-ylamino	3	0	O	H	H	H	326.2
1002	imidazolin-2-ylamino	2	0	O	H	H	H	
1003	imidazolin-2-ylamino	2	0	O	H	NHCbz	H	
1004	imidazolin-2-ylamino	3	0	O	H	NHCbz	H	475.2
1005	imidazolin-2-ylamino	2	0	S	H	NHCbz	H	
1006	imidazolin-2-ylamino	3	0	S	H	NHCbz	H	
1007	imidazolin-2-ylamino	2	0	NH	H	NHCbz	H	
1008	imidazolin-2-ylamino	3	0	NH	H	NHCbz	H	
1009	tetrahydropyrimidin-2-ylamino	2	0	O	H	H	H	
1010	tetrahydropyrimidin-2-ylamino	2	0	O	H	NHCbz	H	
1011	tetrahydropyrimidin-2-ylamino	3	0	O	H	H	H	
1012	tetrahydropyrimidin-2-ylamino	3	0	O	H	NHCbz	H	
1013	tetrahydropyrimidin-2-ylamino	2	0	S	H	NHCbz	H	
1014	tetrahydropyrimidin-2-ylamino	3	0	S	H	NHCbz	H	
1015	tetrahydropyrimidin-2-ylamino	2	0	NH	H	NHCbz	H	
1016	tetrahydropyrimidin-2-ylamino	3	0	NH	H	NHCbz	H	
1017	imidazolin-2-ylamino	2	0	O	H	NHCO ₂ -n-Bu	H	

1018	imidazolin-2-ylamino	3	0	O	H	NHCO2-n-Bu	H
1019	imidazolin-2-ylamino	2	0	S	H	NHCO2-n-Bu	H
1020	imidazolin-2-ylamino	3	0	S	H	NHCO2-n-Bu	H
1021	imidazolin-2-ylamino	2	0	NH	H	NHCO2-n-Bu	H
1022	imidazolin-2-ylamino	3	0	NH	H	NHCO2-n-Bu	H
1023	tetrahydropyrimidin-2-ylamino	2	0	O	H	NHCO2-n-Bu	H
1024	tetrahydropyrimidin-2-ylamino	3	0	O	H	NHCO2-n-Bu	H
1025	tetrahydropyrimidin-2-ylamino	2	0	S	H	NHCO2-n-Bu	H
1026	tetrahydropyrimidin-2-ylamino	3	0	S	H	NHCO2-n-Bu	H
1027	tetrahydropyrimidin-2-ylamino	2	0	NH	H	NHCO2-n-Bu	H
1028	tetrahydropyrimidin-2-ylamino	3	0	NH	H	NHCO2-n-Bu	H
1029	imidazolin-2-ylamino	2	0	O	H	NHSO2Ph(o-CH3)	H
1030	imidazolin-2-ylamino	3	0	O	H	NHSO2Ph(o-CH3)	H
1031	imidazolin-2-ylamino	2	0	S	H	NHSO2Ph(o-CH3)	H
1032	imidazolin-2-ylamino	3	0	S	H	NHSO2Ph(o-CH3)	H
1033	imidazolin-2-ylamino	2	0	O	H	NHSO2Ph(m-CH3)	H
1034	imidazolin-2-ylamino	3	0	O	H	NHSO2Ph(m-CH3)	H
1035	imidazolin-2-ylamino	2	0	S	H	NHSO2Ph(m-CH3)	H
1036	imidazolin-2-ylamino	3	0	S	H	NHSO2Ph(m-CH3)	H
1037	imidazolin-2-ylamino	2	0	O	H	NHSO2Ph(p-CH3)	H
1038	imidazolin-2-ylamino	3	0	O	H	NHSO2Ph(p-CH3)	H
1039	imidazolin-2-ylamino	2	0	S	H	NHSO2Ph(p-CH3)	H
1040	imidazolin-2-ylamino	3	0	S	H	NHSO2Ph(p-CH3)	H
1041	imidazolin-2-ylamino	2	0	O	H	NHSO2Ph(o-Cl)	H
1042	imidazolin-2-ylamino	3	0	O	H	NHSO2Ph(o-Cl)	H
1043	imidazolin-2-ylamino	2	0	O	H	NHSO2Ph(m-Cl)	H

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1044	imidazolin-2-ylamino	3	0	0	H	NHSO ₂ Ph (m-Cl)	H
1045	imidazolin-2-ylamino	2	0	0	H	NHSO ₂ Ph (p-Cl)	H
1046	imidazolin-2-ylamino	3	0	0	H	NHSO ₂ Ph (p-Cl)	H
1047	tetrahydropyrimidin-2-ylamino	2	0	0	H	NHSO ₂ Ph (p-Cl)	H
1048	tetrahydropyrimidin-2-ylamino	3	0	0	H	NHSO ₂ Ph (p-Cl)	H
1049	tetrahydropyrimidin-2-ylamino	2	0	0	H	NHSO ₂ Ph (m-Cl)	H
1050	tetrahydropyrimidin-2-ylamino	3	0	0	H	NHSO ₂ Ph (m-Cl)	H
1051	tetrahydropyrimidin-2-ylamino	2	0	0	H	NHSO ₂ Ph (p-Cl)	H
1052	tetrahydropyrimidin-2-ylamino	3	0	0	H	NHSO ₂ Ph (p-Cl)	H
1053	imidazolin-2-ylamino	2	0	0	H	NHSO ₂ Ph (m-F)	H
1054	imidazolin-2-ylamino	3	0	0	H	NHSO ₂ Ph (m-F)	H
1055	tetrahydropyrimidin-2-ylamino	2	0	0	H	NHSO ₂ Ph (m-F)	H
1056	tetrahydropyrimidin-2-ylamino	3	0	0	H	NHSO ₂ Ph (m-F)	H
1057	imidazolin-2-ylamino	2	0	0	H	NHSO ₂ Ph (p-F)	H
1058	imidazolin-2-ylamino	3	0	0	H	NHSO ₂ Ph (p-F)	H
1059	tetrahydropyrimidin-2-ylamino	2	0	0	H	NHSO ₂ Ph (p-F)	H
1060	tetrahydropyrimidin-2-ylamino	3	0	0	H	NHSO ₂ Ph (p-F)	H
1061	imidazolin-2-ylamino	2	0	0	H	NHSO ₂ Ph (m-Br)	H
1062	imidazolin-2-ylamino	3	0	0	H	NHSO ₂ Ph (m-Br)	H
1063	tetrahydropyrimidin-2-ylamino	2	0	0	H	NHSO ₂ Ph (m-Br)	H
1064	tetrahydropyrimidin-2-ylamino	3	0	0	H	NHSO ₂ Ph (m-Br)	H
1065	imidazolin-2-ylamino	2	0	0	H	NHSO ₂ Ph (p-Br)	H
1066	imidazolin-2-ylamino	3	0	0	H	NHSO ₂ Ph (p-Br)	H

1067	tetrahydropyrimidin-2-ylamino	2	0	0	H	NHSO ₂ Ph (p-Br)	H
1068	tetrahydropyrimidin-2-ylamino	3	0	0	H	NHSO ₂ Ph (p-Br)	H
1069	imidazolin-2-ylamino	2	0	0	H	NHSO ₂ Ph (m-OCH ₃)	H
1070	imidazolin-2-ylamino	3	0	0	H	NHSO ₂ Ph (m-OCH ₃)	H
1071	tetrahydropyrimidin-2-ylamino	2	0	0	H	NHSO ₂ Ph (m-OCH ₃)	H
1072	tetrahydropyrimidin-2-ylamino	3	0	0	H	NHSO ₂ Ph (m-OCH ₃)	H
1073	imidazolin-2-ylamino	2	0	0	H	NHSO ₂ Ph (p-OCH ₃)	H
1074	imidazolin-2-ylamino	3	0	0	H	NHSO ₂ Ph (p-OCH ₃)	H
1075	tetrahydropyrimidin-2-ylamino	2	0	0	H	NHSO ₂ Ph (p-OCH ₃)	H
1076	tetrahydropyrimidin-2-ylamino	3	0	0	H	NHSO ₂ Ph (p-OCH ₃)	H
1077	imidazolin-2-ylamino	2	0	0	H	NHSO ₂ Bn	H
1078	imidazolin-2-ylamino	3	0	0	H	NHSO ₂ Bn	H
1079	tetrahydropyrimidin-2-ylamino	2	0	0	H	NHSO ₂ Bn	H
1080	tetrahydropyrimidin-2-ylamino	3	0	0	H	NHSO ₂ Bn	H
1081	imidazolin-2-ylamino	2	0	0	H	NHSO ₂ Et	H
1082	imidazolin-2-ylamino	3	0	0	H	NHSO ₂ Et	H
1083	tetrahydropyrimidin-2-ylamino	2	0	0	H	NHSO ₂ Et	H
1084	tetrahydropyrimidin-2-ylamino	3	0	0	H	NHSO ₂ Et	H
1085	imidazolin-2-ylamino	2	0	0	H	NHSO ₂ -n-Pr	H
1086	imidazolin-2-ylamino	3	0	0	H	NHSO ₂ -n-Pr	H
1087	tetrahydropyrimidin-2-ylamino	2	0	0	H	NHSO ₂ -n-Pr	H
1088	tetrahydropyrimidin-2-ylamino	3	0	0	H	NHSO ₂ -n-Pr	H
1089	imidazolin-2-ylamino	2	0	0	H	NHSO ₂ -n-(C ₅ H ₁₁)	H

1090	imidazolin-2-ylamino	3	0	0	H	NHSO ₂ -n-(C ₅ H ₁₁)	H
1091	tetrahydropyrimidin-2-ylamino	2	0	0	H	NHSO ₂ -n-(C ₅ H ₁₁)	H
1092	tetrahydropyrimidin-2-ylamino	3	0	0	H	NHSO ₂ -n-(C ₅ H ₁₁)	H
1093	imidazolin-2-ylamino	2	0	0	H	NHCO ₂ Et	H
1094	imidazolin-2-ylamino	3	0	0	H	NHCO ₂ Et	H
1095	tetrahydropyrimidin-2-ylamino	2	0	0	H	NHCO ₂ Et	H
1096	tetrahydropyrimidin-2-ylamino	3	0	0	H	NHCO ₂ Et	H
1097	imidazolin-2-ylamino	2	0	0	H	NHCO ₂ -n-C ₅ H ₁₁	H
1098	imidazolin-2-ylamino	3	0	0	H	NHCO ₂ -n-C ₅ H ₁₁	H
1099	tetrahydropyrimidin-2-ylamino	2	0	0	H	NHCO ₂ -n-C ₅ H ₁₁	H
1100	tetrahydropyrimidin-2-ylamino	3	0	0	H	NHCO ₂ -n-C ₅ H ₁₁	H
1101	imidazolin-2-ylamino	4	0	0	H	NHCbz	H
1102	tetrahydropyrimidin-2-ylamino	4	0	0	H	NHCbz	H
1103	imidazolin-2-ylamino	4	0	0	H	NHCO ₂ -n-Bu	H
1104	tetrahydropyrimidin-2-ylamino	4	0	0	H	NHCO ₂ -n-Bu	H
1105	imidazolin-2-ylamino	4	0	0	H	NHSO ₂ Ph	H
1106	tetrahydropyrimidin-2-ylamino	4	0	0	H	NHSO ₂ Ph	H
1107	imidazolin-2-ylamino	4	0	0	H	NHSO ₂ -n-Bu	H
1108	tetrahydropyrimidin-2-ylamino	4	0	0	H	NHSO ₂ -n-Bu	H
1109	imidazolin-2-ylamino	4	0	S	H	NHCbz	H
1110	tetrahydropyrimidin-2-ylamino	4	0	S	H	NHCbz	H
1111	imidazolin-2-ylamino	4	0	S	H	NHSO ₂ Bu	H
1112	tetrahydropyrimidin-2-ylamino	4	0	S	H	NHSO ₂ Bu	H

1113	imidazolin-2-ylamino	2	0	O	Me	H	H
1114	imidazolin-2-ylamino	3	0	O	Me	H	H
1115	tetrahydropyrimidin-2-ylamino	2	0	O	Me	H	H
1116	tetrahydropyrimidin-2-ylamino	3	0	O	Me	H	H
1117	imidazolin-2-ylamino	3	0	S	Me	H	H
1118	tetrahydropyrimidin-2-ylamino	3	0	S	Me	H	H
1119	imidazolin-2-ylamino	2	0	O	Me	NHCbz	H
1120	imidazolin-2-ylamino	3	0	O	Me	NHCbz	H
1121	tetrahydropyrimidin-2-ylamino	2	0	O	Me	NHSO ₂ - <i>n</i> -Bu	H
1122	tetrahydropyrimidin-2-ylamino	3	0	O	Me	NHSO ₂ - <i>n</i> -Bu	H
1123	imidazolin-2-ylamino	2	0	O	Et	H	H
1124	imidazolin-2-ylamino	3	0	O	Et	H	H
1125	tetrahydropyrimidin-2-ylamino	2	0	O	Et	H	H
1126	tetrahydropyrimidin-2-ylamino	3	0	O	Et	H	H
1127	imidazolin-2-ylamino	3	0	S	Et	H	H
1128	tetrahydropyrimidin-2-ylamino	3	0	S	Et	H	H
1129	imidazolin-2-ylamino	2	0	O	Ph	H	H
1130	imidazolin-2-ylamino	3	0	O	Ph	H	H
1131	tetrahydropyrimidin-2-ylamino	2	0	O	Ph	H	H
1132	tetrahydropyrimidin-2-ylamino	3	0	O	Ph	H	H
1133	imidazolin-2-ylamino	3	0	S	Ph	H	H
1134	tetrahydropyrimidin-2-ylamino	3	0	S	Ph	H	H
1135	imidazolin-2-ylamino	2	0	O	Bn	H	H
1136	imidazolin-2-ylamino	3	0	O	Bn	H	H

1137	tetrahydropyrimidin-2-ylamino	2	0	O	Bn	H	H
1138	tetrahydropyrimidin-2-ylamino	3	0	O	Bn	H	H
1139	imidazolin-2-ylamino	3	0	S	Bn	H	H
1140	tetrahydropyrimidin-2-ylamino	3	0	S	Bn	H	H
1141	imidazolin-2-ylamino	2	0	O	H	NHCbz	Me
1142	imidazolin-2-ylamino	3	0	O	H	NHCbz	Me
1143	tetrahydropyrimidin-2-ylamino	2	0	O	H	NHCbz	Me
1144	tetrahydropyrimidin-2-ylamino	3	0	O	H	NHCbz	Me
1145	imidazolin-2-ylamino	2	0	O	H	NHSO ₂ -n-Bu	Me
1146	imidazolin-2-ylamino	3	0	O	H	NHSO ₂ -n-Bu	Me
1147	tetrahydropyrimidin-2-ylamino	2	0	O	H	NHSO ₂ -n-Bu	Me
1148	tetrahydropyrimidin-2-ylamino	3	0	O	H	NHSO ₂ -n-Bu	Me
1149	imidazolin-2-ylamino	3	0	S	H	NHCbz	Me
1150	tetrahydropyrimidin-2-ylamino	3	0	S	H	NHCbz	Me
1151	imidazolin-2-ylamino	3	0	S	H	NHSO ₂ -n-Bu	Me
1152	tetrahydropyrimidin-2-ylamino	3	0	S	H	NHSO ₂ -n-Bu	Me
1153	imidazolin-2-ylamino	2	0	O	H	NHCbz	Bn
1154	imidazolin-2-ylamino	3	0	O	H	NHCbz	Bn
1155	tetrahydropyrimidin-2-ylamino	2	0	O	H	NHCbz	Bn
1156	tetrahydropyrimidin-2-ylamino	3	0	O	H	NHCbz	Bn
1157	imidazolin-2-ylamino	2	0	O	H	NHSO ₂ -n-Bu	Bn
1158	imidazolin-2-ylamino	3	0	O	H	NHSO ₂ -n-Bu	Bn
1159	tetrahydropyrimidin-2-ylamino	2	0	O	H	NHSO ₂ -n-Bu	Bn

1160	tetrahydropyrimidin-2-ylamino	3	0	O	H	NHSO ₂ -n-Bu	Bn
1161	imidazolin-2-ylamino	3	0	S	H	NHCbz	Bn
1162	tetrahydropyrimidin-2-ylamino	3	0	S	H	NHCbz	Bn
1163	imidazolin-2-ylamino	3	0	S	H	NHSO ₂ -n-Bu	Bn
1164	tetrahydropyrimidin-2-ylamino	3	0	S	H	NHSO ₂ -n-Bu	Bn
1165	imidazolin-2-ylamino	3	0	O	Me	NHCbz	Me
1166	tetrahydropyrimidin-2-ylamino	3	0	O	Me	NHSO ₂ Bu	Me
1167	imidazolin-2-ylamino	3	0	O	Bn	NHCbz	Me
1168	tetrahydropyrimidin-2-ylamino	3	0	O	Bn	NHCbz	Me
1169	imidazolin-2-ylamino	3	0	O	Me	NHSO ₂ -n-Bu	Me
1170	tetrahydropyrimidin-2-ylamino	3	0	O	Me	NHCbz	Me
1171	imidazolin-2-ylamino	3	0	O	Bn	NHSO ₂ -n-Bu	Me
1172	tetrahydropyrimidin-2-ylamino	3	0	O	Bn	NHCbz	Me
1173	(4-oxoimidazolin-2-yl)amino	2	0	O	H	NHCbz	H
1174	(4-oxoimidazolin-2-yl)amino	3	0	O	H	NHCbz	H
1175	(4-oxoimidazolin-2-yl)amino	2	0	O	H	NHCO ₂ -n-Bu	H
1176	(4-oxoimidazolin-2-yl)amino	3	0	O	H	NHCO ₂ -n-Bu	H
1177	(4-oxoimidazolin-2-yl)amino	2	0	O	H	NHSO ₂ Ph	H
1178	(4-oxoimidazolin-2-yl)amino	3	0	O	H	NHSO ₂ Ph	H
1179	(4-oxoimidazolin-2-yl)amino	2	0	O	H	NHSO ₂ -n-Bu	H

1180	(4-oxoimidazolin-2-yl)amino	3	0	O	H	NHSO ₂ -n-Bu	H
1181	(4-oxotetrahydropyrimidin-2-yl)amino	3	0	O	H	NHCbz	H
1182	(4-oxotetrahydropyrimidin-2-yl)amino	3	0	O	H	NHCO ₂ -n-Bu	H
1183	(4-oxotetrahydropyrimidin-2-yl)amino	3	0	O	H	NHSO ₂ Ph	H
1184	(4-oxotetrahydropyrimidin-2-yl)amino	3	0	O	H	NHSO ₂ -n-Bu	H
1185	(4-oxoimidazolin-2-yl)amino	3	0	S	H	NHCbz	H
1186	(4-oxoimidazolin-2-yl)amino	3	0	S	H	NHSO ₂ -n-Bu	H
1187	(4-oxotetrahydropyrimidin-2-yl)amino	3	0	S	H	NHCbz	H
1188	(4-oxotetrahydropyrimidin-2-yl)amino	3	0	S	H	NHSO ₂ -n-Bu	H
1189	(4-oxoimidazolin-2-yl)amino	3	0	O	Me	H	H
1190	(4-oxotetrahydropyrimidin-2-yl)amino	3	0	O	Me	H	H
1191	(4-oxoimidazolin-2-yl)amino	3	0	O	Bn	H	H
1192	(4-oxotetrahydropyrimidin-2-yl)amino	3	0	O	Bn	H	H

1193	(4-oxoimidazolin-2-yl)amino	3	0	0	Me	NHCbz	H
1194	oxotetrahydropyrimidin-2-yl)amino	3	0	0	Me	NHSO ₂ -n-Bu	H
1195	(4-oxoimidazolin-2-yl)amino	3	0	0	H	NHCbz	Me
1196	oxotetrahydropyrimidin-2-yl)amino	3	0	0	H	NHCbz	Bn
1197	imidazolin-2-ylaminocarbonyl	1	0	0	H	NHCbz	H
1198	imidazolin-2-ylaminocarbonyl	2	0	0	H	NHCbz	H
1199	tetrahydropyrimidin-2-ylaminocarbonyl	1	0	0	H	NHSO ₂ -n-Bu	H
1200	tetrahydropyrimidin-2-ylaminocarbonyl	2	0	0	H	NHSO ₂ -n-Bu	H
1201	imidazolin-2-ylaminocarbonyl	2	0	0	H	NHCbz	H
1202	tetrahydropyrimidin-2-ylaminocarbonyl	2	0	0	H	NHSO ₂ -n-Bu	H
1203	imidazolin-2-ylaminocarbonyl	1	0	0	H	NHCO ₂ -n-Bu	H
1204	imidazolin-2-ylaminocarbonyl	2	0	0	H	NHCO ₂ -n-Bu	H
1205	tetrahydropyrimidin-2-ylaminocarbonyl	1	0	0	H	NHSO ₂ Ph	H
1206	tetrahydropyrimidin-2-ylaminocarbonyl	2	0	0	H	NHSO ₂ Ph	H
1207	imidazolin-2-ylaminocarbonyl	2	0	0	Me	NHCbz	H
1208	tetrahydropyrimidin-2-ylaminocarbonyl	2	0	0	Me	NHSO ₂ -n-Bu	H

1209	imidazolin-2-ylaminocarbonyl	2	0	O	Bn	H	H
1210	tetrahydropyrimidin-2-ylaminocarbonyl	2	0	O	Bn	H	H
1211	imidazolin-2-ylaminocarbonyl	2	0	O	Me	H	H
1212	tetrahydropyrimidin-2-ylaminocarbonyl	2	0	O	Me	H	H
1213	imidazolin-2-ylaminocarbonyl	2	0	O	H	NHCbz	Me
1214	tetrahydropyrimidin-2-ylaminocarbonyl	2	0	O	H	NHCbz	Me
1215	imidazolin-2-ylaminocarbonyl	2	0	O	H	NHSO ₂ -n-Bu	Me
1216	tetrahydropyrimidin-2-ylaminocarbonyl	2	0	O	H	NHSO ₂ -n-Bu	Me
1217	imidazolin-2-ylaminocarbonyl	2	0	S	Me	H	H
1218	tetrahydropyrimidin-2-ylaminocarbonyl	2	0	S	Bn	H	H
1219	imidazolin-2-ylaminocarbonyl	2	0	S	H	NHCbz	Me
1220	tetrahydropyrimidin-2-ylaminocarbonyl	2	0	S	H	NHSO ₂ -n-Bu	Me
1221	imidazolin-2-ylamino	2	1	O	H	NHCbz	H
1222	imidazolin-2-ylamino	3	1	O	H	NHCbz	H
1223	tetrahydropyrimidin-2-ylamino	2	1	O	H	NHCbz	H
1224	tetrahydropyrimidin-2-ylamino	3	1	O	H	NHCbz	H
1225	imidazolin-2-ylamino	2	1	O	H	NHSO ₂ -n-Bu	H
1226	imidazolin-2-ylamino	3	1	O	H	NHSO ₂ -n-Bu	H

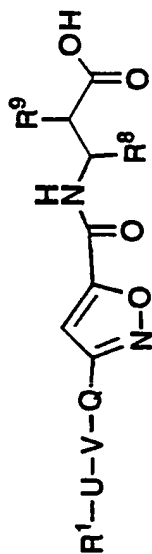
1227	tetrahydropyrimidin-2-ylamino	2	1	O	H	NHSO ₂ -n-Bu	H
1228	tetrahydropyrimidin-2-ylamino	3	1	O	H	NHSO ₂ -n-Bu	H
1229	imidazolin-2-ylamino	2	1	S	H	NHCbz	H
1230	imidazolin-2-ylamino	3	1	S	H	NHCbz	H
1231	tetrahydropyrimidin-2-ylamino	2	1	S	H	NHCbz	H
1232	tetrahydropyrimidin-2-ylamino	3	1	S	H	NHCbz	H
1233	imidazolin-2-ylamino	2	1	O	Me	H	H
1234	imidazolin-2-ylamino	3	1	O	Me	H	H
1235	tetrahydropyrimidin-2-ylamino	2	1	O	Bn	H	H
1236	tetrahydropyrimidin-2-ylamino	3	1	O	Bn	H	H
1237	imidazolin-2-ylamino	2	1	S	Me	H	H
1238	tetrahydropyrimidin-2-ylamino	2	1	S	Bn	H	H
1239	imidazolin-2-ylamino	2	1	O	Me	NHCbz	H
1240	tetrahydropyrimidin-2-ylamino	2	1	O	Me	NHCbz	H
1241	imidazolin-2-ylamino	2	1	O	H	NHCbz	H
1242	tetrahydropyrimidin-2-ylamino	2	1	O	H	NHCbz	H
1243	imidazolin-2-ylamino	3	1	O	H	NHCbz	H
1244	tetrahydropyrimidin-2-ylamino	3	1	O	H	NHCbz	H
1245	pyridin-2-ylamino	2	1	O	H	NHCbz	H
1246	imidazol-2-ylamino	2	1	O	H	NHCbz	H
1251	benzimidazol-2-ylamino	2	1	O	H	NHCbz	H

1252	benzthiazol-2-ylamino	2	1	O	H	NHCbz	H
1255	imidazol-4-ylamino	2	1	O	H	NHCbz	H
1262	pyridin-2-ylamino	3	0	O	H	NHCbz	H
1263	imidazol-2-ylamino	3	0	O	H	NHCbz	H
1268	benzimidazol-2-ylamino	3	0	O	H	NHCbz	H
1269	benzthiazol-2-ylamino	3	0	O	H	NHCbz	H
1272	imidazol-4-ylamino	3	0	O	H	NHCbz	H
1279	pyridin-2-ylamino	2	0	O	H	NHCbz	H
1280	imidazol-2-ylamino	2	0	O	H	NHCbz	H
1285	benzimidazol-2-ylamino	2	0	O	H	NHCbz	H
1286	benzthiazol-2-ylamino	2	0	O	H	NHCbz	H
1289	imidazol-4-ylamino	2	0	O	H	NHCbz	H
1297	imidazolin-2-ylamino	2	0	O	H	NHSO ₂ -n-Bu	447.5
1298	imidazolin-2-ylamino	3	0	O	H	NHSO ₂ Ph	481.4
1299	imidazolin-2-ylamino	2	0	O	H	NHSO ₂ Ph	467.3
1300	imidazolin-2-ylamino	3	0	O	H	NHSO ₂ [4-(3,5-dimethyl)isoxazolyl]	500.3
1301	5-nitropyridin-2-ylamino	3	0	O	H	NHCbz	498.2
1302	imidazol-2-ylamino	3	0	O	H	NHSO ₂ (2,4,6-trimethylphenyl)	H
1303	imidazol-2-ylamino	3	0	O	H	NHSO ₂ (2,4,6-trichlorophenyl)	H
1304	imidazol-2-ylamino	3	0	O	H	NHSO ₂ (2,6-dichlorophenyl)	H
1305	imidazol-2-ylamino	3	0	O	H	NHSO ₂ (2-chloro-6-methylphenyl)	H
1306	imidazol-2-ylamino	3	0	O	H	NHSO ₂ C ₆ H ₄ (2-CH ₃)	H

1307	imidazol-2-ylamino	3	0	0	H	NHSO ₂ C ₆ H ₄ (2-Br)	H
1308	imidazol-2-ylamino	3	0	0	H	NHSO ₂ [4-(2,6-dimethylphenyl)]phenyl	H
1309	imidazol-2-ylamino	3	0	0	H	NHSO ₂ C ₆ H ₄ (4-Ph)	H
1310	imidazol-2-ylamino	3	0	0	H	NHSO ₂ [4-(3,5-dimethyl)isoxazolyl]	H
1311	imidazol-2-ylamino	3	0	0	H	NHSO ₂ (1-naphthyl)	H
1312	imidazol-2-ylamino	3	0	0	H	NHSO ₂ (2-naphthyl)	H
1313	imidazol-2-ylamino	3	0	0	H	NHSO ₂ NHCH ₂ Ph	H
1314	imidazol-2-ylamino	3	0	0	H	NHSO ₂ NHPh	H
1315	imidazol-2-ylamino	3	0	0	Ph	H	H
1316	imidazol-2-ylamino	3	0	0	phenylsulfonylaminomethyl	H	H
1317	imidazol-2-ylamino	3	0	0	3-azabicyclo[3.2.2]nonan-3-ylcarbonyl	H	H
1318	imidazol-2-ylamino	3	0	0	adamantan-1-yl	H	H
1319	imidazol-2-ylamino	3	0	0	methylaminocarbonyl	H	H
1320	imidazol-2-ylamino	3	0	0	aminocarbonyl	H	H
1321	imidazol-2-ylamino	3	0	0	tetrahydroisoquinolin-2-ylcarbonyl	H	H

1322	imidazol-2-ylaminocarbonyl	2	0	0	H	NHSO ₂ (2,4,6-trimethylphenyl)	H
1323	imidazol-2-ylaminocarbonyl	2	0	0	H	NHSO ₂ (2,4,6-trichlorophenyl)	H
1324	imidazol-2-ylaminocarbonyl	2	0	0	H	NHSO ₂ (2,6-dichlorophenyl)	H
1325	imidazol-2-ylaminocarbonyl	2	0	0	H	NHSO ₂ (2-chloro-6-methylphenyl)	H
1326	imidazol-2-ylaminocarbonyl	2	0	0	H	NHSO ₂ C ₆ H ₄ (2-CH ₃)	H
1327	imidazol-2-ylaminocarbonyl	2	0	0	H	NHSO ₂ C ₆ H ₄ (2-Br)	H
1328	imidazol-2-ylaminocarbonyl	2	0	0	H	NHSO ₂ [4-(2,6-dimethylphenyl)phenyl]	H
1329	imidazol-2-ylaminocarbonyl	2	0	0	H	NHSO ₂ C ₆ H ₄ (4-Ph)	H
1330	imidazol-2-ylaminocarbonyl	2	0	0	H	NHSO ₂ [4-(3,5-dimethyl)isoxazoly]	H
1331	imidazol-2-ylaminocarbonyl	2	0	0	H	NHSO ₂ (1-naphthyl)	H
1332	imidazol-2-ylaminocarbonyl	2	0	0	H	NHSO ₂ (2-naphthyl)	H
1333	imidazol-2-ylaminocarbonyl	2	0	0	H	NHSO ₂ NHCH ₂ Ph	H
1334	imidazol-2-ylaminocarbonyl	2	0	0	H	NHSO ₂ NHPh	H

Table 4

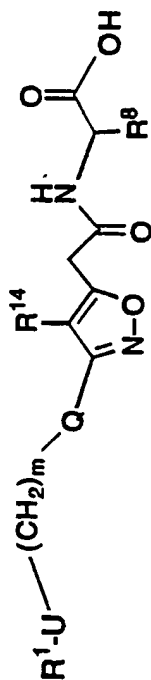


No.	R¹-U	V	Q	R⁸	R⁹	MS
1501	imidazolin-2-ylamino	1,4-phenylene	O	H	NHCBz	
1502	tetrahydropyrimidin-2-ylamino	1,4-phenylene	O	H	NHCBz	
1503	imidazolin-2-ylamino	1,4-phenylene	O	H	NHSO₂-n-Bu	
1504	tetrahydropyrimidin-2-ylamino	1,4-phenylene	O	H	NHSO₂-n-Bu	
1505	imidazolin-2-ylamino	1,4-phenylene	S	H	NHCBz	
1506	tetrahydropyrimidin-2-ylamino	1,4-phenylene	S	H	NHCBz	
1507	imidazolin-2-ylamino	1,4-phenylene	S	H	NHSO₂-n-Bu	
1508	tetrahydropyrimidin-2-ylamino	1,4-phenylene	S	H	NHSO₂-n-Bu	
1509	imidazolin-2-ylamino	1,4-phenylene	NH	H	NHCBz	
1510	tetrahydropyrimidin-2-ylamino	1,4-phenylene	NH	H	NHCBz	
1511	imidazolin-2-ylamino	1,4-phenylene	NH	H	NHSO₂-n-Bu	
1512	tetrahydropyrimidin-2-ylamino	1,4-phenylene	NH	H	NHSO₂-n-Bu	
1513	imidazolin-2-ylamino	1,4-phenylene	O	Me	H	
1514	tetrahydropyrimidin-2-ylamino	1,4-phenylene	O	Me	H	
1515	imidazolin-2-ylamino	1,4-phenylene	O	Bn	H	
1516	tetrahydropyrimidin-2-ylamino	1,4-phenylene	O	Bn	H	
1517	imidazolin-2-ylamino	1,4-phenylene	S	Me	H	
1518	tetrahydropyrimidin-2-ylamino	1,4-phenylene	S	Me	H	
1519	imidazolin-2-ylamino	1,4-phenylene	S	Bn	H	

1520	tetrahydropyrimidin-2-ylamino	1,4-phenylene	S	Bn	H
1521	imidazolin-2-ylamino	1,4-phenylene	O	Me	NHCbz
1522	tetrahydropyrimidin-2-ylamino	1,4-phenylene	O	Me	NHCbz
1523	imidazolin-2-ylamino	1,4-phenylene	O	H	NHCbz
No.	R ¹ -U	V	Q	R ⁸	R ⁹
1524	tetrahydropyrimidin-2-ylamino	1,4-phenylene	O	H	NHCbz
1525	imidazolin-2-ylamino	1,3-phenylene	O	H	NHCbz
1526	tetrahydropyrimidin-2-ylamino	1,3-phenylene	O	H	NHCbz
1527	imidazolin-2-ylamino	1,3-phenylene	O	H	NHSO ₂ -n-Bu
1528	tetrahydropyrimidin-2-ylamino	1,3-phenylene	O	H	NHSO ₂ -n-Bu
1529	imidazolin-2-ylamino	1,3-phenylene	S	H	NHCbz
1530	tetrahydropyrimidin-2-ylamino	1,3-phenylene	S	H	NHCbz
1531	imidazolin-2-ylamino	1,3-phenylene	S	H	NHSO ₂ -n-Bu
1532	tetrahydropyrimidin-2-ylamino	1,3-phenylene	S	H	NHSO ₂ -n-Bu
1533	imidazolin-2-ylamino	1,3-phenylene	NH	H	NHCbz
1534	tetrahydropyrimidin-2-ylamino	1,3-phenylene	NH	H	NHCbz
1535	imidazolin-2-ylamino	1,3-phenylene	NH	H	NHCbz
1536	tetrahydropyrimidin-2-ylamino	1,3-phenylene	NH	H	NHCbz
1537	imidazolin-2-ylamino	1,3-phenylene	O	Me	H
1538	tetrahydropyrimidin-2-ylamino	1,3-phenylene	O	Me	H
1539	imidazolin-2-ylamino	1,3-phenylene	O	Bn	H
1540	tetrahydropyrimidin-2-ylamino	1,3-phenylene	O	Bn	H
1541	imidazolin-2-ylamino	1,3-phenylene	O	Me	NHCbz
1542	tetrahydropyrimidin-2-ylamino	1,3-phenylene	O	Me	NHCbz
1543	imidazolin-2-ylamino	1,3-phenylene	S	Me	H
1544	tetrahydropyrimidin-2-ylamino	1,3-phenylene	S	Me	H

1545	imidazolin-2-ylamino	1,3-phenylene	S	Bn	H
1546	tetrahydropyrimidin-2-ylamino	1,3-phenylene	S	Bn	H
1547	imidazolin-2-ylamino	1,3-phenylene	O	H	NHCbz
1548	tetrahydropyrimidin-2-ylamino	1,3-phenylene	O	H	NHCbz

Table 5



No.	R ¹ -U	m	Q	R ⁸	R ¹⁴	MS
1601	imidazolin-2-ylamino	2	O	Bn	H	
1602	imidazolin-2-ylamino	3	O	Bn	H	
1603	tetrahydropyrimidin-2-ylamino	2	O	Bn	H	
1604	tetrahydropyrimidin-2-ylamino	3	O	Bn	H	
1605	imidazolin-2-ylamino	2	O	Bn(p-OCH ₃)	H	
1606	tetrahydropyrimidin-2-ylamino	2	O	Bn(p-OCH ₃)	H	
1607	imidazolin-2-ylamino	3	O	Bn(p-OCH ₃)	H	
1608	tetrahydropyrimidin-2-ylamino	3	O	Bn(p-OCH ₃)	H	
1609	imidazolin-2-ylamino	2	O	Bn(p-F)	H	
1610	imidazolin-2-ylamino	3	O	Bn(p-F)	H	
1611	tetrahydropyrimidin-2-ylamino	2	O	Bn(p-F)	H	
1612	tetrahydropyrimidin-2-ylamino	3	O	Bn(p-F)	H	
1613	imidazolin-2-ylamino	2	S	Bn	H	
1614	imidazolin-2-ylamino	3	S	Bn	H	
1615	tetrahydropyrimidin-2-ylamino	2	S	Bn	H	
1616	tetrahydropyrimidin-2-ylamino	3	S	Bn	H	
1617	imidazolin-2-ylamino	2	O	Bn	Me	
1618	imidazolin-2-ylamino	3	O	Bn	Me	
1619	tetrahydropyrimidin-2-ylamino	2	O	Bn	Me	

1620	tetrahydropyrimidin-2-ylamino	3	O	Bn	Me
1621	imidazolin-2-ylamino	2	NH	Bn	H
1622	imidazolin-2-ylamino	3	NH	Bn	H
1623	tetrahydropyrimidin-2-ylamino	2	NH	Bn	H
No.	R ¹ -U	m	Q	R ⁸	R ¹⁴
1624	tetrahydropyrimidin-2-ylamino	3	NH	Bn	H

Utility

The compounds of Formula I of the present invention
5 possess activity as antagonists of integrins such as,
for example, the $\alpha_v\beta_3$ or vitronectin receptor, $\alpha_v\beta_5$ or
 $\alpha_5\beta_1$, and as such have utility in the treatment and
diagnosis of cell adhesion, angiogenic disorders,
inflammation, bone degradation, cancer metastases,
10 diabetic retinopathy, thrombosis, restenosis, macular
degeneration, and other conditions mediated by cell
adhesion and/or cell migration and/or angiogenesis. The
integrin antagonist activity of the compounds of the
present invention is demonstrated using assays which
15 measure the binding of a specific integrin to a native
ligand, for example, using the ELISA assay described
below for the binding of vitronectin to the $\alpha_v\beta_3$
receptor.

The compounds of the present invention possess
20 selectivity for the $\alpha_v\beta_3$ receptor relative to the
GPIIb/IIIa receptor as demonstrated by their lack of
activity in standard assays of platelet aggregation,
such as the platelet aggregation assay described below.

One of the major roles of integrins *in vivo* is to
25 mediate cellular interactions with adjacent cells. Cell
based adhesion assays can be used to mimic these
interactions *in vitro*. A cell based assay is more
representative of the *in vivo* situation than an ELISA
since the receptor is maintained in membranes in the
30 native state. The compounds of the present invention
have activity in cell-based assays of adhesion, for
example as demonstrated in using the cell adhesion
assays described below.

35 The compounds of Formula I of the present invention
may be useful for the treatment or prevention of other

diseases which involve cell adhesion processes, including, but not limited to, osteoporosis, rheumatoid arthritis, autoimmune disorders, bone degradation, rheumatoid arthritis, asthma, allergies, adult
5 respiratory distress syndrome, graft versus host disease, organ transplantation, septic shock, psoriasis, eczema, contact dermatitis, osteoarthritis, atherosclerosis, metastasis, wound healing, inflammatory
10 bowel disease and other angiogenic disorders.

10 The compounds of Formula I have the ability to suppress/inhibit angiogenesis in vivo, for example, as demonstrated using animal models of ocular neovascularization.

The compounds provided by this invention are also
15 useful as standards and reagents in determining the ability of a potential pharmaceutical to inhibit integrin-ligand binding. These may be provided in a commercial kit comprising a compound of this invention.

20 As used herein "µg" denotes microgram, "mg" denotes milligram, "g" denotes gram, "µL" denotes microliter, "mL" denotes milliliter, "L" denotes liter, "nM" denotes nanomolar, "µM" denotes micromolar, "mM" denotes millimolar, "M" denotes molar and "nm" denotes
25 nanometer. "Sigma" stands for the Sigma-Aldrich Corp. of St. Louis, MO.

The utility of the compounds of the present invention may be assessed by testing in one or more of
30 the following assays as described in detail below: Purified $\alpha_v\beta_3$ (human placenta) - Vitronectin ELISA, $\alpha_v\beta_3$ -Vitronectin Binding Assay, Human Aortic Smooth Muscle Cell Migration Assay, In Vivo Angiogenesis Model, Pig Restenosis Model, Mouse Retinopathy Model. A
35 compound of the present invention is considered to be active if it has an IC_{50} or K_i value of less than about

10 μM for the inhibition of $\alpha_v\beta_3$ -Vitronectin Binding Assay, with compounds preferably having K_i values of less than about 0.1 μM . Tested compounds of the present invention are active in the $\alpha_v\beta_3$ -Vitronectin Binding Assay.

Purified $\alpha_v\beta_3$ (human placenta) - Vitronectin ELISA

The $\alpha_v\beta_3$ receptor was isolated from human placental extracts prepared using octylglucoside. The extracts were passed over an affinity column composed of anti- $\alpha_v\beta_3$ monoclonal antibody (LM609) to Affigel. The column was subsequently washed extensively at pH 7 and pH 4.5 followed by elution at pH 3. The resulting sample was concentrated by wheat germ agglutinin chromatography to provide two bands on SDS gel which were confirmed as $\alpha_v\beta_3$ by western blotting.

Affinity purified protein was diluted at different levels and plated to 96 well plates. ELISA was performed using fixed concentration of biotinylated vitronectin (approximately 80 nM/well). This receptor preparation contains the $\alpha_v\beta_3$ with no detectable levels of $\alpha_v\beta_5$ according to the gel ($\alpha_v\beta_3$) and according to effects of blocking antibodies for the $\alpha_v\beta_3$ or $\alpha_v\beta_5$ in the ELISA.

A submaximal concentration of biotinylated vitronectin was selected based on conc. response curve with fixed receptor conc. and variable concentrations of biotinylated vitronectin.

$\alpha_v\beta_3$ -Vitronectin Binding Assay

The purified receptor is diluted with coating buffer (20 mM Tris HCl, 150 mM NaCl, 2.0 mM CaCl_2 , 1.0 mM $\text{MgCl}_2 \cdot 6\text{H}_2\text{O}$, 1.0 mM $\text{MnCl}_2 \cdot 4\text{H}_2\text{O}$) and coated (100 μL /well) on Costar (3590) high capacity binding plates overnight at 4°C. The coating solution is discarded and the plates washed once with blocking/binding buffer (B/B buffer, 50 mM Tris HCl, 100 mM NaCl, 2.0 mM CaCl_2 , 1.0 mM

MgCl₂·6H₂O, 1.0 mM MnCl₂·4H₂O). Receptor is then blocked (200 µL/well) with 3.5% BSA in B/B buffer for 2 hours at room temperature. After washing once with 1.0% BSA in B/B buffer, biotinylated vitronectin (100 µL) and either inhibitor (11 µL) or B/B buffer w/1.0% BSA (11 µL) is added to each well. The plates are incubated 2 hours at room temperature. The plates are washed twice with B/B buffer and incubated 1 hour at room temperature with anti-biotin alkaline phosphatase (100 µL/well) in B/B buffer containing 1.0% BSA. The plates are washed twice with B/B buffer and alkaline phosphatase substrate (100 µL) is added. Color is developed at room temperature. Color development is stopped by addition of 2N NaOH (25 µL/well) and absorbance is read at 405 nm. The IC₅₀ is the concentration of test substance needed to block 50% of the vitronectin binding to the receptor.

Integrin Cell-Based Adhesion Assays

In the adhesion assays, a 96 well plate was coated with the ligand (i.e., fibrinogen) and incubated overnight at 4° C. The following day, the cells were harvested, washed and loaded with a fluorescent dye. Compounds and cells were added together and then were immediately added to the coated plate. After incubation, loose cells are removed from the plate, and the plate (with adherent cells) is counted on a fluorometer. The ability of test compounds to inhibit cell adhesion by 50% is given by the IC₅₀ value and represents a measure of potency of inhibition of integrin mediated binding. Compounds were tested for their ability to block cell adhesion using assays specific for α_vβ₃, α_vβ₅ and α₅β₁ integrin interactions.

Platelet Aggregation Assay

Venous blood was obtained from anesthetized mongrel dogs or from healthy human donors who were drug- and

aspirin-free for at least two weeks prior to blood collection. Blood was collected into citrated Vacutainer tubes. The blood was centrifuged for 15 minutes at 150 x g (850 RPM in a Sorvall RT6000 Tabletop Centrifuge with H-1000 B rotor) at room temperature, and platelet-rich plasma (PRP) was removed. The remaining blood was centrifuged for 15 minutes at 1500 x g (26,780 RPM) at room temperature, and platelet-poor plasma (PPP) was removed. Samples were assayed on a PAP-4 Platelet Aggregation Profiler, using PPP as the blank (100% transmittance). 200 μ L of PRP (5×10^8 platelets/mL) were added to each micro test tube, and transmittance was set to 0%. 20 μ L of ADP (10 μ M) was added to each tube, and the aggregation profiles were plotted (% transmittance versus time). Test agent (20 μ L) was added at different concentrations prior to the addition of the platelet agonist. Results are expressed as % inhibition of agonist-induced platelet aggregation.

20 Human Aortic Smooth Muscle Cell Migration Assay

A method for assessing $\alpha_v\beta_3$ -mediated smooth muscle cell migration and agents which inhibit $\alpha_v\beta_3$ -mediated smooth muscle cell migration is described in Liaw et al., *J. Clin. Invest.* (1995) 95: 713-724).

25

In Vivo Angiogenesis Model

A quantitative method for assessing angiogenesis and antiangiogenic agents is described in Passaniti et al., *Laboratory Investigation* (1992) 67: 519-528

30

Pig Restenosis Model

A method for assessing restenosis and agents which inhibit restenosis is described in Schwartz et al., *J. Am. College of Cardiology* (1992) 19: 267-274.

35

Mouse Retinopathy Model

A method for assessing retinopathy and agents which inhibit retinopathy is described in Smith et al., *Invest. Ophthalm. & Visual Science* (1994) 35: 101-111.

5

Dosage and Formulation

The compounds of this invention can be administered by any means that produces contact of the active agent with the agent's site of action, the $\alpha_v\beta_3$ integrin, in the body of a mammal. They can be administered by any conventional means available for use in conjunction with pharmaceuticals, either as individual therapeutic agents or in a combination of therapeutic agents, such as a antiplatelet agent such as aspirin, piroxicam, or ticlopidine which are agonist-specific, or an anti-coagulant such as warfarin or heparin, or a thrombin inhibitor such as a boro-peptide, hirudin or argatroban, or a thrombolytic agent such as tissue plasminogen activator, anistreplase, urokinase or streptokinase, or combinations thereof. The compounds of the invention, or compounds of the invention in combination with other therapeutic agents, can be administered alone, but generally administered with a pharmaceutical carrier selected on the basis of the chosen route of administration and standard pharmaceutical practice.

The dosage of the novel cyclic compounds of this invention administered will, of course, vary depending upon known factors, such as the pharmacodynamic characteristics of the particular agent and its mode and route of administration; the age, health and weight of the recipient; the nature and extent of the symptoms; the kind of concurrent treatment; the frequency of treatment; and the effect desired. A daily dosage of

active ingredient can be expected to be about 0.001 to 10 milligrams per kilogram of body weight.

Dosage forms (compositions suitable for administration) contain from about 0.1 milligram to about 100 milligrams of active ingredient per unit. In these pharmaceutical compositions the active ingredient will ordinarily be present in an amount of about 0.5-95% by weight based on the total weight of the composition.

The active ingredient can be administered orally in solid dosage forms, such as capsules, tablets, and powders, or in liquid dosage forms, such as elixirs, syrups, and suspensions. It can also be administered parenterally, in sterile liquid dosage forms.

Gelatin capsules contain the active ingredient and powdered carriers, such as lactose, starch, cellulose derivatives, magnesium stearate, stearic acid, and the like. Similar diluents can be used to make compressed tablets. Both tablets and capsules can be manufactured as sustained release products to provide for continuous release of medication over a period of hours. Compressed tablets can be sugar coated or film coated to mask any unpleasant taste and protect the tablet from the atmosphere, or enteric coated for selective disintegration in the gastrointestinal tract.

Liquid dosage forms for oral administration can contain coloring and flavoring to increase patient acceptance.

In general, water, a suitable oil, saline, aqueous dextrose (glucose), and related sugar solutions and glycols such as propylene glycol or polyethylene glycols are suitable carriers for parenteral solutions. Solutions for parenteral administration preferably contain a water soluble salt of the active ingredient, suitable stabilizing agents, and if necessary, buffer substances. Antioxidizing agents such as sodium bisulfite, sodium sulfite, or ascorbic acid, either

alone or combined, are suitable stabilizing agents. Also used are citric acid and its salts and sodium EDTA. In addition, parenteral solutions can contain preservatives, such as benzalkonium chloride, methyl- or propyl-paraben, and chlorobutanol.

Suitable pharmaceutical carriers are described in *Remington's Pharmaceutical Sciences*, Mack Publishing Company, a standard reference text in this field.

Useful pharmaceutical dosage-forms for administration of the compounds of this invention can be illustrated as follows:

Capsules

A large number of unit capsules are prepared by filling standard two-piece hard gelatin capsules each with 10 milligrams of powdered active ingredient, 150 milligrams of lactose, 50 milligrams of cellulose, and 6 milligrams magnesium stearate.

Soft Gelatin Capsules

A mixture of active ingredient in a digestable oil such as soybean oil, cottonseed oil or olive oil is prepared and injected by means of a positive displacement pump into gelatin to form soft gelatin capsules containing 10 milligrams of the active ingredient. The capsules are washed and dried.

Tablets

A large number of tablets are prepared by conventional procedures so that the dosage unit was 10 milligrams of active ingredient, 0.2 milligrams of colloidal silicon dioxide, 5 milligrams of magnesium stearate, 275 milligrams of microcrystalline cellulose, 11 milligrams of starch and 98.8 milligrams of lactose. Appropriate coatings may be applied to increase palatability or delay absorption.

The compounds for the present invention can be administered in intranasal form via topical use of suitable intranasal vehicles, or via transdermal routes, using those forms of transdermal skin patches well known to those of ordinary skill in that art. To be administered in the form of a transdermal delivery system, the dosage administration will, of course, be continuous rather than intermittent throughout the dosage regimen.

The active ingredient can be administered intranasally to a mammal at a dosage range of about 0.01 to 0.5 mg/kg while the preferred dosage range is about 0.01-0.1 mg/kg.

Compositions of the active ingredients can be administered intranasally by preparing a suitable formulation of the active ingredient by procedures well known to those skilled in the art. Preferably the formulations are prepared with suitable nontoxic pharmaceutically acceptable ingredients. These ingredients are known to those skilled in the preparation of nasal dosage forms and some of these can be found in REMINGTON'S PHARMACEUTICAL SCIENCES. 17th edition, 1985 a standard reference in the field. The choice of suitable carriers is highly dependent upon the exact nature of the nasal dosage form desired, e.g., solutions, suspensions, ointments, or gels. Nasal dosage forms generally contain large amounts of water in addition to the active ingredient. Minor amounts of other ingredients such as pH adjusters, emulsifiers or dispersing agents, preservatives, surfactants, jelling agents, or buffering and other stabilizing and solubilizing agents may also be present. Preferably, the nasal dosage form should be isotonic with nasal secretions.

An example of a nasal solution composition of this invention includes:

Active Drug	0.2-2 g
Sorbitol	0.6 g
Benzalkonium chloride	0.002 g
Hydrochloric acid	to adjust pH
Sodium hydroxide	to adjust pH
Purified water	to 10 mL

5 In this example the active drug can be in one vial and the rest of the formulation can be in another vial. The drug can be reconstituted when needed.

 The formulation of this invention may be varied to include: (1) other acids and bases to adjust the pH; (2)
10 other tonicity imparting agents such as glycerin and dextrose; (3) other antimicrobial preservatives such as other parahydroxy benzoic acid esters, sorbate, benzoate, propionate, chlorbutanol, phenylethyl alcohol, and mercurials; (4) other viscosity imparting agents
15 such as sodium carboxy-methylcellulose microcrystalline cellulose, polyvinyl-pyrrolidone, polyvinyl alcohol and other gums; (5) suitable absorption enhancers; (6) stabilizing agents such as antioxidants, like bisulfite and ascorbate, metal chelating agents such as sodium
20 edetate and drug solubility enhancers such as polyethylene glycols.

 The above formulation can be administered as drops, sprays, aerosols or by any other intranasal dosage form. Optionally, the delivery system can be a unit dose
25 delivery system. The volume of solution or suspension delivered per dose can be anywhere from 5 to 400 μ L, and preferably between 50 and 150 μ L. Delivery systems for these various dosage forms can be dropper bottles, plastic squeeze units, atomizers, nebulizers or

pharmaceutical aerosols in either unit dose or multiple dose packages.

5 The combination products of this invention, such as
the novel $\alpha_v\beta_3$ antagonist compounds of this invention in
combination with an anti-coagulant agent such as
warfarin or heparin, or an anti-platelet agent such as
aspirin, piroxicam or ticlopidine, or a thrombin
inhibitor such as a boro-peptide, hirudin or argatroban,
10 or a thrombolytic agent such as tissue plasminogen
activator, anistreplase, urokinase or streptokinase, or
combinations thereof, can be in any dosage form, such as
those described above, and can also be administered in
various ways, as described above.

15 In a preferred embodiment, the combination products
of the invention are formulated together, in a single
dosage form (that is, combined together in one capsule,
tablet, powder, or liquid, etc.). When the combination
products are not formulated together in a single dosage
20 form, the $\alpha_v\beta_3$ antagonist compounds of this invention and
the anti-coagulant agent, anti-platelet agent, thrombin
inhibitor, and/or thrombolytic agent may be administered
at the same time (that is, together), or in any order,
for example the compounds of this invention are
25 administered first, followed by administration of the
anti-coagulant agent, anti-platelet agent, thrombin
inhibitor, and/or thrombolytic agent. When not
administered at the same time, preferably the
administration of the compound of this invention and any
30 anti-coagulant agent, anti-platelet agent, thrombin
inhibitor, and/or thrombolytic agent occurs less than
about one hour apart, more preferably less than about 30
minutes apart, even more preferably less than about 15
minutes apart, and most preferably less than about 5
35 minutes apart. Preferably, administration of the
combination products of the invention is oral. The

terms oral agent, oral inhibitor, oral compound, or the like, as used herein, denote compounds which may be orally administered. Although it is preferable that the $\alpha_v\beta_3$ antagonist compounds of this invention and the

5 anti-coagulant agent, anti-platelet agent, thrombin inhibitor, and/or thrombolytic agent are both administered in the same fashion (that is, for example, both orally), if desired, they may each be administered in different fashions (that is, for example, one

10 component of the combination product may be administered orally, and another component may be administered intravenously). The dosage of the combination products of the invention may vary depending upon various factors such as the pharmacodynamic characteristics of the

15 particular agent and its mode and route of administration, the age, health and weight of the recipient, the nature and extent of the symptoms, the kind of concurrent treatment, the frequency of treatment, and the effect desired, as described above.

20 As discussed above, where two or more of the foregoing therapeutic agents are combined or co-administered with the compounds of this invention, generally the amount of each component in a typical daily dosage and typical dosage form may be reduced

25 relative to the usual dosage of the agent when administered alone, in view of the additive or synergistic effect which would be obtained as a result of addition of further agents in accordance with the present invention.

30 Particularly when provided as a single dosage form, the potential exists for a chemical interaction between the combined active ingredients (for example, a novel compound of this invention and an anti-coagulant such as warfarin or heparin, or a novel compound of this

35 invention and an anti-platelet agent such as aspirin, piroxicam or ticlopidine, or a novel compound of this

invention and a thrombin inhibitor such as a
boreopeptide, hirudin or argatroban, or a novel compound
of this invention and a thrombolytic agent such as
tissue plasminogen activator, anistreplase, urokinase or
5 streptokinase, or combinations thereof). For this
reason, the preferred dosage forms of the combination
products of this invention are formulated such that
although the active ingredients are combined in a single
dosage form, the physical contact between the active
10 ingredients is minimized (that is, reduced).

In order to minimize contact, one embodiment of
this invention where the product is orally administered
provides for a combination product wherein one active
ingredient is enteric coated. By enteric coating one of
15 the active ingredients, it is possible not only to
minimize the contact between the combined active
ingredients, but also, it is possible to control the
release of one of these components in the
gastrointestinal tract such that one of these components
20 is not released in the stomach but rather is released in
the intestines. Another embodiment of this invention
where oral administration is desired provides for a
combination product wherein one of the active
ingredients is coated with a sustained-release material
25 which effects a sustained-release throughout the
gastrointestinal tract and also serves to minimize
physical contact between the combined active
ingredients. Furthermore, the sustained-released
component can be additionally enteric coated such that
30 the release of this component occurs only in the
intestine. Still another approach would involve the
formulation of a combination product in which the one
component is coated with a sustained and/or enteric
release polymer, and the other component is also coated
35 with a polymer such as a low viscosity grade of
hydroxypropyl methylcellulose (HPMC) or other

appropriate materials as known in the art, in order to further separate the active components. The polymer coating serves to form an additional barrier to interaction with the other component.

- 5 Dosage forms of the combination products of the present invention wherein one active ingredient is enteric coated can be in the form of tablets such that the enteric coated component and the other active ingredient are blended together and then compressed into
- 10 a tablet or such that the enteric coated component is compressed into one tablet layer and the other active ingredient is compressed into an additional layer. Optionally, in order to further separate the two layers, one or more placebo layers may be present such that the
- 15 placebo layer is between the layers of active ingredients. In addition, dosage forms of the present invention can be in the form of capsules wherein one active ingredient is compressed into a tablet or in the form of a plurality of microtablets, particles, granules
- 20 or non-perils, which are then enteric coated. These enteric coated microtablets, particles, granules or non-perils are then placed into a capsule or compressed into a capsule along with a granulation of the other active ingredient.
- 25 These as well as other ways of minimizing contact between the components of combination products of the present invention, whether administered in a single dosage form or administered in separate forms but at the same time by the same manner, will be readily apparent
- 30 to those skilled in the art, once armed with the present disclosure.

Pharmaceutical kits useful in, for example, the inhibition of thrombus formation, the prevention of

35 blood clots, and/or the treatment of thromboembolic disorders, which comprise a therapeutically effective

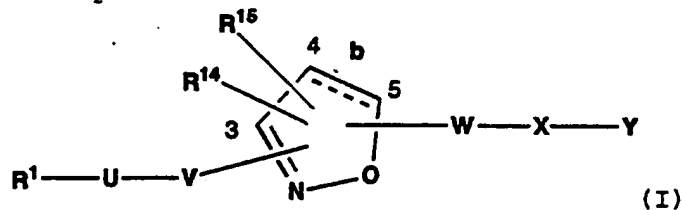
amount of a compound according to the method of the present invention along with a therapeutically effective amount of an anti-coagulant agent such as warfarin or heparin, or an antiplatelet agent such as aspirin, piroxicam or ticlopidine, or a thrombin inhibitor such as a boroheptide, hirudin or argatroban, or a thrombolytic agent such as tissue plasminogen activator, anistreplase, urokinase or streptokinase, or combinations thereof, in one or more sterile containers, are also within the ambit of the present invention. Sterilization of the container may be carried out using conventional sterilization methodology well known to those skilled in the art. The sterile containers of materials may comprise separate containers, or one or more multi-part containers, as exemplified by the UNIVIAL™ two-part container (available from Abbott Labs, Chicago, Illinois), as desired. The compounds according to the method of the invention and the anti-coagulant agent, anti-platelet agent, thrombin inhibitor, thrombolytic agent, and/or combinations thereof, may be separate, or combined into a single dosage form as described above. Such kits may further include, if desired, one or more of various conventional pharmaceutical kit components, such as for example, one or more pharmaceutically acceptable carriers, additional vials for mixing the components, etc., as will be readily apparent to those skilled in the art. Instructions, either as inserts or as labels, indicating quantities of the components to be administered, guidelines for administration, and/or guidelines for mixing the components, may also be included in the kit.

CLAIMS

WHAT IS CLAIMED IS:

5

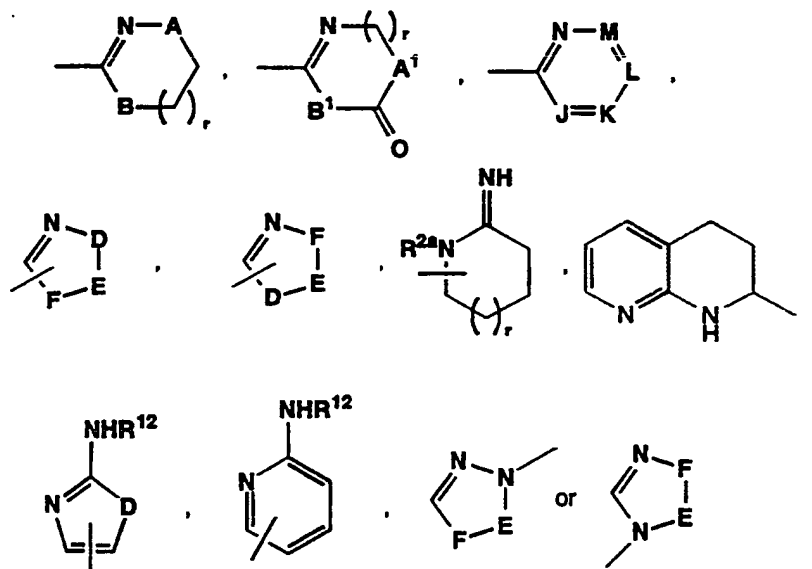
1. A compound of Formula I:



including stereoisomeric forms thereof, or mixtures of
 10 stereoisomeric forms thereof, or pharmaceutically
 acceptable salt or prodrug forms thereof wherein:

b, the bond between carbon atoms numbered 4 and 5, is a
 carbon-carbon single or double bond;

15

R¹ is selected from:

A and B are independently $-\text{CH}_2-$, $-\text{O}-$, $-\text{N}(\text{R}^{12})-$, or $-\text{C}(=\text{O})-$;

A^1 and B^1 are independently $-\text{CH}_2-$ or $-\text{N}(\text{R}^{10})-$;

5

D is $-\text{N}(\text{R}^{2a})-$, $-\text{O}-$, $-\text{S}-$, $-\text{C}(=\text{O})-$ or $-\text{SO}_2-$;

E-F is $-\text{C}(\text{R}^2)=\text{C}(\text{R}^3)-$, $-\text{N}=\text{C}(\text{R}^2)-$, $-\text{C}(\text{R}^2)=\text{N}-$, $-\text{N}=\text{N}-$, or $-\text{C}(\text{R}^2)_2\text{C}(\text{R}^3)_2-$;

10

J, K, L and M are independently selected from $-\text{C}(\text{R}^2)-$ or $-\text{N}-$, provided that at least one of J, K, L and M is $-\text{C}(\text{R}^2)-$;

15 R^2 and R^3 are independently selected from: H, C_1-C_4 alkoxy, $\text{NR}^{11}\text{R}^{12}$, $=\text{NR}^{12}$, halogen, NO_2 , CN, CF_3 , C_1-C_6 alkyl, C_3-C_6 alkenyl, C_3-C_7 cycloalkyl, C_4-C_{11} cycloalkylalkyl, C_6-C_{10} aryl, C_7-C_{11} arylalkyl, C_2-C_7 alkylcarbonyl, C_6-C_{10} carbonyl or C_7-C_{11} arylcarbonyl;

20

alternatively, R^2 and R^3 , when substituents on adjacent atoms, can be taken together with the carbon atoms to which they are attached to form a 5-7 membered carbocyclic or 5-7 membered heterocyclic aromatic or nonaromatic ring system, said carbocyclic or heterocyclic ring being optionally substituted with 0-2 R^7 ;

25

30 R^{2a} is absent or R^{12} ;

U is selected from:

$-(\text{CH}_2)_n-$,

$-(\text{CH}_2)_n\text{O}(\text{CH}_2)_m-$,

35

$-(\text{CH}_2)_n\text{N}(\text{R}^{12})(\text{CH}_2)_m-$,

- (CH₂)_nC(=O) (CH₂)_m- ,
- (CH₂)_nS(O)_p (CH₂)_m- ,
- (CH₂)_nNHNNH (CH₂)_m- ,
- N(R¹⁰)C(=O) - , or
- 5 - C(=O)N(R¹⁰) - ;
- N(R¹⁰)S(O)_p- , or

- V is selected from:
- (CH₂)_n- ,
 - 10 - (C₁-C₆ alkylene)-Q- , substituted with 0-3 groups independently selected from R¹³,
 - (C₂-C₇ alkenylene)-Q- , substituted with 0-3 groups independently selected from R¹³,
 - (C₂-C₇ alkynylene)-Q- , substituted with 0-3 groups
 - 15 independently selected from R¹³,
 - (phenyl)-Q- , said phenyl substituted with 0-2 groups independently selected from R¹³,
 - (pyridyl)-Q- , said pyridyl substituted with 0-2 groups independently selected from R¹³, or
 - 20 - (pyridazinyl)-Q- , said pyridazinyl substituted with 0-2 groups independently selected from R¹³;

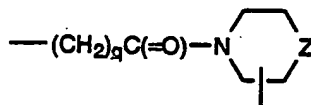
- Q is selected from:
- 25 - (CH₂)_n- ,
 - (CH₂)_nO (CH₂)_m- ,
 - (CH₂)_nN(R¹²) (CH₂)_m- ,
 - (CH₂)_nC(=O) (CH₂)_m- ,
 - (CH₂)_nS(O)_p (CH₂)_m- ,
 - 30 - (CH₂)_nNHNNH (CH₂)_m- ,
 - N(R¹⁰)C(=O) - , or
 - C(=O)N(R¹⁰) - ;

- W is selected from:
- 35 - (C(R⁴)₂)_qC(=O)N(R¹⁰) - ,
 - C(=O) - N(R¹⁰) - (C(R⁴)₂)_q- ;

X is selected from:
 a single bond (i.e., X is absent),
 $-(C(R^4)_2)_q-[C(R^4)(R^8)]_s-C(R^4)(R^9)-$;

5

alternatively, W is

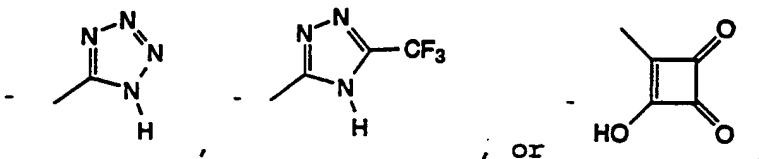


and X is absent or $-CH_2-$

10 Y is selected from:

$-COR^{20}$, $-SO_3H$, $-PO_3H$, $-CONHNHSO_2CF_3$, $-CONHSO_2R^{18a}$,
 $-CONHSO_2NHR^{18b}$, $-NHCOCF_3$, $-NHCONHSO_2R^{18a}$,
 $-NHSO_2R^{18a}$, $-OPO_3H_2$, $-OSO_3H$, $-PO_3H_2$, $-SO_3H$,
 $-SO_2NHCOR^{18a}$, $-SO_2NHCO_2R^{18a}$, or

15



Z is selected from $-CH(R^9)-$, or $-N(R^{16})-$;

20 R^4 is selected from H, C_1-C_{10} alkyl, C_1-C_{10} alkylcarbonyl, aryl, arylalkyl, cycloalkyl, or cycloalkylalkyl;

alternatively, two R^4 groups on adjacent carbon
 25 atoms may join to form a bond, thereby to form a carbon-carbon double or triple bond between the adjacent carbon atoms;

R^5 is selected from H, C_1-C_6 alkyl, C_2-C_6 alkenyl, C_2-C_6 alkynyl, C_3-C_7 cycloalkyl, C_7-C_{14} bicycloalkyl,
 30 hydroxy, C_1-C_6 alkoxy, C_1-C_6 alkylthio, C_1-C_6

alkylsulfinyl, C₁-C₆ alkylsulfonyl, nitro, C₁-C₆ alkylcarbonyl, C₆-C₁₀ aryl, -N(R¹¹)R¹², halo, CF₃, CN, C₁-C₆ alkoxy carbonyl, carboxy, piperidinyl, morpholinyl or pyridinyl;

5

R⁶ is selected from:

H, C₁-C₁₀ alkyl, hydroxy, C₁-C₁₀ alkoxy, nitro, C₁-C₁₀ alkylcarbonyl, -N(R¹¹)R¹², cyano, halo, CF₃, CHO, CO₂R^{18b}, C(=O)R^{18b}, CONR¹⁷R^{18b},
 10 OC(=O)R¹⁰, OC(=O)OR²¹, OR¹⁰, OC(=O)NR¹⁰R¹¹, OCH₂CO₂R¹⁰, CO₂CH₂CO₂R¹⁰, NO₂, NR¹⁰C(=O)R¹⁰, NR¹⁰C(=O)OR²¹, NR¹⁰C(=O)NR¹⁰R¹¹, NR¹⁰SO₂NR¹⁰R¹¹, NR¹⁰SO₂R²¹, S(O)_pR¹¹, SO₂NR¹⁰R¹¹, SiMe₃, C₂ to C₆ alkenyl, C₃ to C₁₁ cycloalkyl, C₄ to C₁₁ cycloalkylmethyl,
 15 C₆ to C₁₀ aryl optionally substituted with 1-3 groups selected from halogen, C₁-C₆ alkoxy, C₁-C₆ alkyl, CF₃, S(O)_mMe, or -NMe₂;
 C₇ to C₁₁ arylalkyl, said aryl being optionally substituted with 1-3 groups selected from halogen, C₁-C₆ alkoxy, C₁-C₆ alkyl, CF₃, S(O)_pMe, or -NMe₂,
 20 methylenedioxy when R⁶ is a substituent on aryl, or a 5-10 membered heterocyclic ring containing 1-3 N, O, or S heteroatoms, wherein said heterocyclic ring may be saturated, partially saturated, or fully unsaturated, said heterocyclic ring being substituted with 0-2 R⁷;

25

30 R⁷ is selected from:

H, C₁-C₁₀ alkyl, hydroxy, C₁-C₁₀ alkoxy, nitro, C₁-C₁₀ alkylcarbonyl, -N(R¹¹)R¹², cyano, halo, CF₃, CHO, CO₂R¹⁰, C(=O)R¹⁰, CONR¹⁰R¹¹,
 OC(=O)R¹⁰, OC(=O)OR²¹, OR¹⁰, OC(=O)NR¹⁰R¹¹,
 35 OCH₂CO₂R¹⁰, CO₂CH₂CO₂R¹⁰, NO₂, NR¹⁰C(=O)R¹⁰,

NR¹⁰C(=O)OR²¹, NR¹⁰C(=O)NR¹⁰R¹¹, NR¹⁰SO₂NR¹⁰R¹¹,
 NR¹⁰SO₂R²¹, S(O)_pR¹¹, SO₂NR¹⁰R¹¹, SiMe₃, C₂ to
 C₆ alkenyl, C₃ to C₁₁ cycloalkyl, C₄ to C₁₁
 cycloalkylmethyl, C₆ to C₁₀ aryl, or C₇ to C₁₁
 arylalkyl;

R⁸ is selected from:
 H, R⁶,
 C₁-C₁₀ alkyl, substituted with 0-3 R⁶,
 C₂-C₁₀ alkenyl, substituted with 0-3 R⁶,
 C₂-C₁₀ alkynyl, substituted with 0-3 R⁶,
 C₃-C₈ cycloalkyl, substituted with 0-3 R⁶,
 C₅-C₆ cycloalkenyl, substituted with 0-3 R⁶,
 aryl, substituted with 0-3 R⁶, or
 5-10 membered heterocyclic ring containing 1-3 N,
 O, or S heteroatoms, wherein said heterocyclic
 ring may be saturated, partially saturated, or
 fully unsaturated, said heterocyclic ring
 being substituted with 0-2 R⁷;

R⁹ is selected from H, hydroxy, C₁-C₁₀ alkoxy, nitro,
 N(R¹⁰)R¹¹, -N(R¹⁶)R¹⁷, OR²², C₁-C₁₀ alkyl substituted
 with 0-3 R⁷, aryl substituted with 0-3 R⁷,
 heteroaryl substituted with 0-3 R⁷, C₁-C₁₀
 alkylcarbonyl; aryl(C₀-C₆ alkyl)carbonyl, C₁-C₁₀
 alkenyl, C₁-C₁₀ alkynyl, C₃-C₁₀ cycloalkyl, C₃-C₁₀
 cycloalkylalkyl, aryl(C₁-C₆ alkyl)-, heteroaryl(C₁-
 C₆ alkyl)-, CO₂R^{18a}, C(=O)R^{18a}, CONR^{18a}R²⁰, SO₂R^{18a},
 or SO₂NR^{18a}R²⁰, provided that any of the above
 alkyl, cycloalkyl, aryl or heteroaryl groups may
 be unsubstituted or substituted independently with
 0-2 R⁷;

R¹⁰ is selected from H, C₁-C₈ alkyl, C₃-C₆ alkenyl,
 C₃-C₁₁ cycloalkyl, C₄-C₁₁ cycloalkylmethyl, C₆-C₁₀

aryl, C₇-C₁₁ arylalkyl, or C₁-C₁₀ alkyl substituted with 0-2 R⁴;

R¹¹ is selected from hydrogen, hydroxy, C₁ to C₈ alkyl, C₃-C₆ alkenyl, C₃ to C₁₁ cycloalkyl, C₄ to C₁₁ cycloalkylmethyl, C₁-C₆ alkoxy, benzyloxy, C₆ to C₁₀ aryl, heteroaryl, heteroarylalkyl, C₇ to C₁₁ arylalkyl, adamantylmethyl, or C₁-C₁₀ alkyl substituted with 0-2 R⁴;

10

alternatively, R¹⁰ and R¹¹ when both are substituents on the same nitrogen atom (as in -NR¹⁰R¹¹) can be taken together with the nitrogen atom to which they are attached to form a heterocycle selected from:

15 3-azabicyclononyl, 1,2,3,4-tetrahydro-1-quinolinyl, 1,2,3,4-tetrahydro-2-isoquinolinyl, 1-piperidinyl, 1-morpholinyl, 1-pyrrolidinyl, thiamorpholinyl, thiazolidinyl or 1-piperazinyl; said heterocycle being optionally substituted with 0-3 groups
20 selected from: C₁-C₆ alkyl, C₆-C₁₀ aryl, heteroaryl, C₇-C₁₁ arylalkyl, C₁-C₆ alkylcarbonyl, C₃-C₇ cycloalkylcarbonyl, C₁-C₆ alkoxycarbonyl, C₇-C₁₁ arylalkoxycarbonyl, C₁-C₆ alkylsulfonyl or C₆-C₁₀ arylsulfonyl;

25

R¹² is selected from:

H, C₁-C₁₀ alkyl, triphenylmethyl, methoxyphenyldiphenylmethyl, trimethylsilylethoxymethoxy (SEM), C₁-C₁₀
30 alkoxycarbonyl, C₁-C₁₀ alkylcarbonyl, C₁-C₁₀ alkylsulfonyl, aryl(C₁-C₁₀ alkyl)sulfonyl, arylsulfonyl, aryl(C₂-C₁₀ alkenyl)sulfonyl, heteroarylsulfonyl, aryl, C₂-C₆ alkenyl, C₃-C₁₁ cycloalkyl, C₄-C₁₁ cycloalkylalkyl, C₇-C₁₁
35 arylalkyl, C₇-C₁₁ arylcarbonyl, C₄-C₁₁

- cycloalkoxycarbonyl, C₇-C₁₁ bicycloalkoxycarbonyl, C₇-C₁₁ aryloxycarbonyl, heteroarylcarbonyl, heteroarylalkylcarbonyl, or aryl(C₁-C₁₀ alkoxy)carbonyl; wherein said aryl groups are optionally substituted with 0-3 substituents selected from the group consisting of: C₁-C₄ alkyl, C₁-C₄ alkoxy, halo, CF₃, and NO₂;
- R¹³** is selected from: H, hydroxy, C₁-C₁₀ alkoxy, nitro, N(R¹⁰)R¹¹, -N(R¹⁶)R¹⁷, C₁-C₁₀ alkyl substituted with 0-3 R⁷, aryl substituted with 0-3 R⁷, heteroaryl substituted with 0-3 R⁷, or C₁-C₁₀ alkylcarbonyl;
- R¹⁴** is selected from H, C₁-C₁₀ alkyl, C₂-C₁₀ alkenyl, C₂-C₁₀ alkynyl, C₁-C₁₀ alkoxy, aryl, heteroaryl or C₁-C₁₀ alkoxycarbonyl, CO₂R¹⁰ or -C(=O)N(R¹⁰)R¹¹;
- R¹⁵** is selected from:
 H, R⁶, -CO₂R¹⁰, -C(=O)N(R¹⁰)R¹¹,
 C₁-C₁₀ alkoxycarbonyl substituted with 0-2 R⁶,
 C₁-C₁₀ alkyl, substituted with 0-3 R⁶,
 C₂-C₁₀ alkenyl, substituted with 0-3 R⁶,
 C₁-C₁₀ alkoxy, substituted with 0-3 R⁶,
 aryl, substituted with 0-3 R⁶; or
 5-10 membered heterocyclic ring containing 1-3 N, O, or S heteroatoms, wherein said heterocyclic ring may be saturated, partially saturated, or fully unsaturated, said heterocyclic ring being substituted with 0-2 R⁷;
- R¹⁶** is selected from:
 -C(=O)-O-R^{18a},
 -C(=O)-R^{18b},
 -C(=O)N(R^{18b})₂,
 -C(=O)NHSO₂R^{18a},
 -C(=O)NHC(=O)R^{18b},

- C(=O)NHC(=O)OR^{18a},
- C(=O)NHSO₂NHR^{18b},
- C(=S)-NH-R^{18b},
- NH-C(=O)-O-R^{18a},
- 5 -NH-C(=O)-R^{18b},
- NH-C(=O)-NH-R^{18b},
- SO₂-O-R^{18a},
- SO₂-R^{18a},
- SO₂-N(R^{18b})₂,
- 10 -SO₂-NHC(=O)OR^{18b};

R¹⁷ is selected from: H, C₁-C₁₀ alkyl, C₂-C₆ alkenyl, C₃-C₁₁ cycloalkyl, C₄-C₁₅ cycloalkylalkyl, aryl, aryl(C₁-C₁₀ alkyl)-;

15

R^{18a} is selected from:

- C₁-C₈ alkyl substituted with 0-2 R¹⁹,
- C₂-C₈ alkenyl substituted with 0-2 R¹⁹,
- C₂-C₈ alkynyl substituted with 0-2 R¹⁹,
- 20 C₃-C₈ cycloalkyl substituted with 0-2 R¹⁹,
- aryl substituted with 0-4 R¹⁹,
- aryl(C₁-C₆ alkyl)- substituted with 0-4 R¹⁹,
- a 5-10 membered heterocyclic ring system having 1-3
- heteroatoms selected independently from O, S,
- 25 and N, said heterocyclic ring being
- substituted with 0-4 R¹⁹,
- C₁-C₆ alkyl substituted with a 5-10 membered
- heterocyclic ring system having 1-3
- heteroatoms selected independently from O, S,
- 30 and N, said heterocyclic ring being
- substituted with 0-4 R¹⁹;

R^{18b} is selected from R^{18a} or H;

- 35 R¹⁹ is selected from H, halogen, CF₃, CO₂H, CN, NO₂,
- NR¹¹R¹², C₁-C₈ alkyl, C₂-C₆ alkenyl, C₂-C₆ alkynyl,

- C₃-C₁₁ cycloalkyl, C₄-C₁₁ cycloalkylalkyl, aryl(C₁-C₆ alkyl)-, C₁-C₆ alkoxy, OCF₃, or C₁-C₄ alkoxy carbonyl, aryl, -O-aryl, -SO₂-aryl, heteroaryl, or -SO₂-heteroaryl, wherein said aryl and heteroaryl groups may be substituted with 0-4 groups selected from hydrogen, halogen, CF₃, C₁-C₃ alkyl, or C₁-C₃ alkoxy;
- 5
 10
 15
 20
 25
 30
 35
- R²⁰ is selected from hydroxy, C₁ to C₁₀ alkyloxy, C₃ to C₁₁ cycloalkyloxy, C₆ to C₁₀ aryloxy, C₇ to C₁₁ arylalkyloxy, C₃ to C₁₀ alkylcarbonyloxyalkyloxy, C₃ to C₁₀ alkoxy carbonyloxyalkyloxy, C₂ to C₁₀ alkoxy carbonylalkyloxy, C₅ to C₁₀ cycloalkylcarbonyloxyalkyloxy, C₅ to C₁₀ cycloalkoxy carbonyloxyalkyloxy, C₅ to C₁₀ cycloalkoxy carbonylalkyloxy, C₇ to C₁₁ aryloxy carbonylalkyloxy, C₈ to C₁₂ aryloxy carbonyloxyalkyloxy, C₈ to C₁₂ arylcarbonyloxyalkyloxy, C₅ to C₁₀ alkoxyalkylcarbonyloxyalkyloxy, C₅ to C₁₀ (5-alkyl-1,3-dioxo-cyclopenten-2-one-yl)methyloxy, C₁₀ to C₁₄ (5-aryl-1,3-dioxo-cyclopenten-2-one-yl)methyloxy, (R¹¹) (R¹²)N-(C₁-C₁₀ alkoxy)-;
- R²¹ is selected from: C₁-C₈ alkyl, C₂-C₆ alkenyl, C₃-C₁₁ cycloalkyl, C₄-C₁₁ cycloalkylmethyl, C₆-C₁₀ aryl, C₇-C₁₁ arylalkyl, or C₁-C₁₀ alkyl substituted with 0-2 R⁵;
- R²² is selected from:
- C(=O)-R^{18b},
 - C(=O)N(R^{18b})₂,
 - C(=O)NHSO₂R^{18a},
 - C(=O)NHC(=O)R^{18b},
 - C(=O)NHC(=O)OR^{18a},

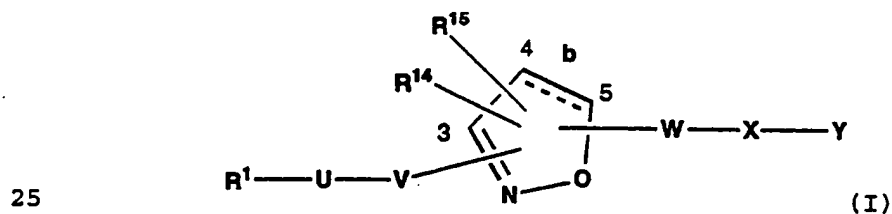
- C(=O)NHSO₂NHR^{18b},
 -C(=S)-NH-R^{18b},
 -SO₂-R^{18a},
 -SO₂-N(R^{18b})₂,
 5 -SO₂-NHC(=O)OR^{18b};

- m is 0-2;
 n is 0-4;
 p is 0-2;
 10 q is 0-4;
 r is 0-2;
 s is 0-1;

with the following provisos:

- 15 (1) when b is a double bond, only one of R¹⁴ or R¹⁵
 is present and Q and U are not -(CH₂)-; and
 (2) n, m and q are chosen such that the number of
 atoms connecting R¹ and Y is in the range of
 8-14; and
 20 (3) when V is -(phenyl)-Q-, then either: U is not a
 direct bond or Q is not a direct bond.

2. A compound of Claim 1 of Formula I:

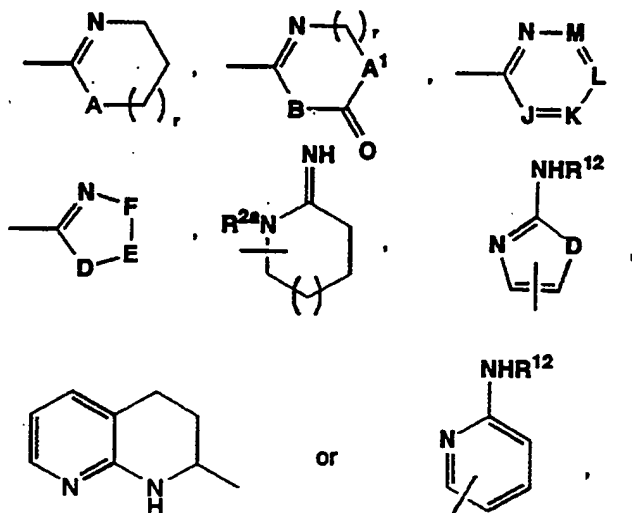


- including stereoisomeric forms thereof, or mixtures of
 stereoisomeric forms thereof, or pharmaceutically
 acceptable salt or prodrug forms thereof wherein:
 30 wherein:

b, the bond between carbon atoms numbered 4 and 5, is a carbon-carbon single or double bond;

R^1 is selected from:

5



A is selected from $-CH_2-$, or $-N(R^{12})-$;

10 A^1 and B are independently $-CH_2-$ or $-N(R^{10})-$;

D is $-N(R^{12})-$, or $-S-$;

E-F is $-C(R^2)=C(R^3)-$, or $-C(R^2)_2C(R^3)_2-$;

15

J is either $-C(R^2)-$ or $-N-$, and K, L and M are independently selected from $-C(R^2)-$ or $-C(R^3)-$;

20 R^2 and R^3 are independently selected from: H, C_1-C_4 alkoxy, $NR^{11}R^{12}$, $=NR^{12}$, halogen, NO_2 , CN, CF_3 , C_1-C_6 alkyl, C_3-C_6 alkenyl, C_3-C_7 cycloalkyl, C_4-C_{11} cycloalkylalkyl, C_6-C_{10} aryl substituted with 0-4 R^7 , C_7-C_{11} arylalkyl, C_2-C_7 alkylcarbonyl, C_1-C_4 alkoxy carbonyl, or C_7-C_{11} arylcarbonyl;

alternatively, R^2 and R^3 when substituents on adjacent atoms, can be taken together when substituents on adjacent atoms, with the carbon atoms to which they are attached, to form a 5-7 membered carbocyclic or 5-7 membered heterocyclic with the carbon atoms to which they are attached, aromatic or nonaromatic ring system, said carbocyclic or heterocyclic ring being optionally substituted with 0-2 groups selected from C_1 - C_4 alkyl, C_1 - C_4 alkoxy, halo, cyano, amino, CF_3 or NO_2 ;

R^{2a} is absent or R^{12} ;

15 U is selected from:

- $(CH_2)_n$ -,
- $(CH_2)_nO(CH_2)_m$ -,
- $(CH_2)_nN(R^{12})(CH_2)_m$ -,
- $(CH_2)_nC(=O)(CH_2)_m$ -,
- 20 - $(CH_2)_nS(O)_p(CH_2)_m$ -,
- $(CH_2)_nNHNH(CH_2)_m$ -,
- $N(R^{10})C(=O)$ -, or
- $C(=O)N(R^{10})$ -;
- $N(R^{10})S(O)_p$ -, or

25

V is selected from:

- $(CH_2)_n$ -,
- $(C_1$ - C_6 alkylene)-Q-, substituted with 0-3 groups independently selected from R^{13} ,
- 30 - $(C_2$ - C_7 alkenylene)-Q-, substituted with 0-3 groups independently selected from R^{13} ,
- $(C_2$ - C_7 alkynylene)-Q-, substituted with 0-3 groups independently selected from R^{13} ,
- (phenyl)-Q-, said phenyl substituted with 0-2
- 35 groups independently selected from R^{13} ,

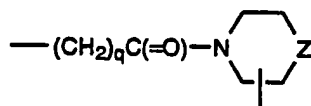
- 5 -(pyridyl)-Q-, said pyridyl substituted with 0-2
 groups independently selected from R^{13} , or
 -(pyridazinyl)-Q-, said pyridazinyl substituted
 with 0-2 groups independently selected from
 R^{13} ;

- Q is selected from:
 - $(CH_2)_n$ -,
 - $(CH_2)_nO(CH_2)_m$ -,
 10 - $(CH_2)_nN(R^{12})(CH_2)_m$ -,
 - $(CH_2)_nC(=O)(CH_2)_m$ -,
 - $(CH_2)_nS(O)_p(CH_2)_m$ -,
 - $(CH_2)_nNHNH(CH_2)_m$ -,
 - $N(R^{10})C(=O)$ -, or
 15 - $C(=O)N(R^{10})$ -;

- W is selected from:
 - $(C(R^4)_2)_qC(=O)N(R^{10})$ - or,
 - $C(=O)N(R^{10})-(C(R^4)_2)_q$ -;

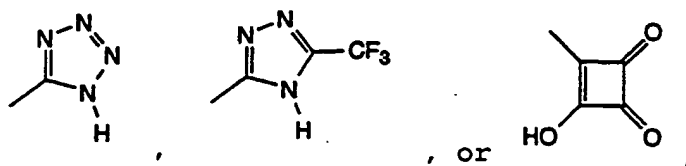
- 20 X is selected from:
 a single bond (i.e., X is absent) or,
 - $(C(R^4)_2)_q-[C(R^4)(R^8)]_s-C(R^4)(R^9)$ -;

- 25 alternatively, W is



and X is either absent or $-CH_2-$

- Y is selected from:
 30 - COR^{20} , - SO_3H , - PO_3H , - $CONHNHSO_2CF_3$,
 - $CONHSO_2R^{18a}$, - $CONHSO_2NHR^{18b}$, - $NHCOCF_3$,
 - $NHCONHSO_2R^{18a}$, - $NHSO_2R^{18a}$, - OPO_3H_2 , - OSO_3H ,
 - PO_3H_2 , - SO_3H , - SO_2NHCOR^{18a} , - $SO_2NHCO_2R^{18a}$, or



Z is selected from $-\text{CH}(\text{R}^9)-$, or $-\text{N}(\text{R}^{16})-$;

- 5 R^4 is selected from H, $\text{C}_1\text{-C}_{10}$ alkyl, $\text{C}_1\text{-C}_{10}$ alkylcarbonyl, aryl, arylalkyl, cycloalkyl, or cycloalkylalkyl;

10 alternatively, two R^4 groups on adjacent carbon atoms may join to form a bond, thereby to form a carbon-carbon double or triple bond between the adjacent carbon atoms;

R^6 is selected from:

- 15 H, $\text{C}_1\text{-C}_{10}$ alkyl, hydroxy, $\text{C}_1\text{-C}_{10}$ alkoxy, nitro, $\text{C}_1\text{-C}_{10}$ alkylcarbonyl, $-\text{N}(\text{R}^{11})\text{R}^{12}$, cyano, halo, CF_3 , CHO , $\text{CO}_2\text{R}^{18b}$, $\text{C}(=\text{O})\text{R}^{18b}$, $\text{CONR}^{17}\text{R}^{18b}$, $\text{OC}(=\text{O})\text{R}^{10}$, OR^{10} , $\text{OC}(=\text{O})\text{NR}^{10}\text{R}^{11}$, $\text{NR}^{10}\text{C}(=\text{O})\text{R}^{10}$, $\text{NR}^{10}\text{C}(=\text{O})\text{OR}^{21}$, $\text{NR}^{10}\text{C}(=\text{O})\text{NR}^{10}\text{R}^{11}$, $\text{NR}^{10}\text{SO}_2\text{NR}^{10}\text{R}^{11}$, $\text{NR}^{10}\text{SO}_2\text{R}^{21}$, $\text{S}(\text{O})_p\text{R}^{11}$, $\text{SO}_2\text{NR}^{10}\text{R}^{11}$,
- 20 C_6 to C_{10} aryl optionally substituted with 0-3 groups selected from halogen, $\text{C}_1\text{-C}_6$ alkoxy, $\text{C}_1\text{-C}_6$ alkyl, CF_3 , $\text{S}(\text{O})_p\text{Me}$, or $-\text{NMe}_2$;
- C_7 to C_{11} arylalkyl, said aryl being optionally substituted with 1-3 groups selected from
- 25 halogen, $\text{C}_1\text{-C}_6$ alkoxy, $\text{C}_1\text{-C}_6$ alkyl, CF_3 , $\text{S}(\text{O})_p\text{Me}$, or $-\text{NMe}_2$,
- a 5-10 membered heterocyclic ring containing 1-3 N, O, or S heteroatoms, wherein said heterocyclic ring may be saturated, partially saturated, or
- 30 fully unsaturated, said heterocyclic ring being substituted with 0-2 R^7 ;

- 5 R^7 is selected from selected from H, C_1 - C_4 alkyl, hydroxy, C_1 - C_4 alkoxy, C_6 - C_{10} aryl, C_7 - C_{11} arylalkyl, (C_1 - C_4 alkyl)carbonyl, CO_2R^{18a} , SO_2R^{11} , $SO_2NR^{10}R^{11}$, OR^{10} , or $N(R^{11})R^{12}$;
- 10 R^8 is selected from:
 H, CO_2R^{18a} , $C(=O)R^{18a}$, or $CONR^{17}R^{18a}$
 C_1 - C_{10} alkyl, substituted with 0-1 R^6 ,
 C_2 - C_{10} alkenyl, substituted with 0-1 R^6 ,
 C_2 - C_{10} alkynyl, substituted with 0-1 R^6 ,
 C_3 - C_8 cycloalkyl, substituted with 0-1 R^6 ,
 C_5 - C_6 cycloalkenyl, substituted with 0-1 R^6 ,
 aryl, substituted with 0-3 R^6 , or
 5-10 membered heterocyclic ring containing 1-3 N,
 15 O, or S heteroatoms, wherein said heterocyclic ring may be saturated, partially saturated, or fully unsaturated, said heterocyclic ring being substituted with 0-2 R^7 ;
- 20 R^9 is selected from H, hydroxy, C_1 - C_{10} alkoxy, nitro, $N(R^{10})R^{11}$, $-N(R^{16})R^{17}$, OR^{22} , C_1 - C_{10} alkyl substituted with 0-3 R^7 , aryl substituted with 0-3 R^7 , heteroaryl substituted with 0-3 R^7 , C_1 - C_{10} alkylcarbonyl; aryl(C_0 - C_6 alkyl)carbonyl, C_1 - C_{10} alkenyl, C_1 - C_{10} alkynyl, C_3 - C_{10} cycloalkyl, C_3 - C_{10} cycloalkylalkyl, aryl(C_1 - C_6 alkyl)-, heteroaryl(C_1 - C_6 alkyl)-, CO_2R^{18a} , $C(=O)R^{18a}$, $CONR^{18a}R^{20}$, SO_2R^{18a} , or $SO_2NR^{18a}R^{20}$, provided that any of the above
 25 alkyl, cycloalkyl, aryl or heteroaryl groups may
 30 be unsubstituted or substituted independently with 0-2 R^7 ;
- R^{10} is selected from H, C_1 - C_8 alkyl, C_3 - C_6 alkenyl, C_3 - C_{11} cycloalkyl, C_4 - C_{11} cycloalkylmethyl, C_6 - C_{10}

aryl, C₇-C₁₁ arylalkyl, or C₁-C₁₀ alkyl substituted with 0-2 R⁴;

R¹¹ is selected from hydrogen, hydroxy, C₁ to C₈ alkyl, C₃-C₆ alkenyl, C₃ to C₁₁ cycloalkyl, C₄ to C₁₁ cycloalkylmethyl, C₁-C₆ alkoxy, benzyloxy, C₆ to C₁₀ aryl, heteroaryl, heteroarylalkyl, C₇ to C₁₁ arylalkyl, adamantylmethyl, or C₁-C₁₀ alkyl substituted with 0-2 R⁴;

alternatively, R¹⁰ and R¹¹ when both are substituents on the same nitrogen atom (as in -NR¹⁰R¹¹) can be taken together with the nitrogen atom to which they are attached to form a heterocycle selected from:

3-azabicyclononyl, 1,2,3,4-tetrahydro-1-quinolinyl, 1,2,3,4-tetrahydro-2-isoquinolinyl, 1-piperidinyl, 1-morpholinyl, 1-pyrrolidinyl, thiamorpholinyl, thiazolidinyl or 1-piperazinyl; said heterocycle being optionally substituted with 0-3 groups selected from: C₁-C₆ alkyl, C₆-C₁₀ aryl, heteroaryl, C₇-C₁₁ arylalkyl, C₁-C₆ alkylcarbonyl, C₃-C₇ cycloalkylcarbonyl, C₁-C₆ alkoxycarbonyl, C₇-C₁₁ arylalkoxycarbonyl, C₁-C₆ alkylsulfonyl or C₆-C₁₀ arylsulfonyl;

R¹² is selected from:

H, C₁-C₆ alkyl, triphenylmethyl, methoxyphenyldiphenylmethyl, trimethylsilylethoxymethoxy (SEM), (C₁-C₆ alkyl)carbonyl, (C₁-C₆ alkoxy)carbonyl; (C₁-C₆ alkyl)aminocarbonyl, C₃-C₆ alkenyl, C₃-C₇ cycloalkyl, C₄-C₁₁ cycloalkylalkyl, aryl, heteroaryl(C₁-C₆ alkyl)carbonyl, heteroarylcarbonyl, aryl C₁-C₆ alkyl, (C₁-C₆ alkyl)carbonyl, or arylcarbonyl, C₁-C₆

- alkylsulfonyl, arylsulfonyl, aryl(C₁-C₆ alkyl)sulfonyl, heteroarylsulfonyl, heteroaryl(C₁-C₆ alkyl)sulfonyl, aryloxycarbonyl, or aryl(C₁-C₆ alkoxy)carbonyl, wherein said aryl groups are substituted with 0-2 substituents selected from the group consisting of C₁-C₄ alkyl, C₁-C₄ alkoxy, halo, CF₃, and nitro;
- 5
- R¹³ is selected from: H, hydroxy, C₁-C₁₀ alkoxy, nitro, N(R¹⁰)R¹¹, -N(R¹⁶)R¹⁷, C₁-C₁₀ alkyl substituted with 0-3 R⁷, aryl substituted with 0-3 R⁷, heteroaryl substituted with 0-3 R⁷, or C₁-C₁₀ alkylcarbonyl;
- 10
- R¹⁴ is selected from H, C₁-C₁₀ alkyl, C₂-C₁₀ alkenyl, C₂-C₁₀ alkynyl, C₁-C₁₀ alkoxy, aryl, heteroaryl or C₁-C₁₀ alkoxycarbonyl, CO₂R¹⁰ or -C(=O)N(R¹⁰)R¹¹;
- 15
- R¹⁵ is selected from: H, CO₂R^{18a}, C(=O)R^{18a}, CONR^{18a}R¹⁷, -SO₂R^{18a}, -SO₂NR^{18a}R¹⁷, C₁-C₆ alkyl substituted with 0-1 R⁹, C₃-C₆ alkenyl substituted with 0-1 R⁹, C₃-C₇ cycloalkyl substituted with 0-1 R⁹, C₄-C₁₁ cycloalkylalkyl substituted with 0-1 R⁹, aryl substituted with 0-1 R⁹ or 0-2 R⁷, or aryl(C₁-C₆ alkyl) - substituted with 0-1 R⁹ or 0-2 R⁷;
- 20
- 25
- R¹⁶ is selected from:
- C(=O)-O-R^{18a},
- C(=O)-R^{18b},
- C(=O)N(R^{18b})₂,
- 30 -C(=O)NHSO₂R^{18a},
- C(=O)NHC(=O)R^{18b},
- C(=O)NHC(=O)OR^{18a},
- C(=O)NHSO₂NHR^{18b},
- SO₂-R^{18a},
- 35 -SO₂-N(R^{18b})₂ or,
- SO₂-NHC(=O)OR^{18b};

R¹⁷ is selected from: H, C₁-C₆ alkyl, C₃-C₇ cycloalkyl, C₄-C₁₁ cycloalkylalkyl, aryl, aryl(C₁-C₆ alkyl)-, or heteroaryl(C₁-C₆ alkyl);

.5

R^{18a} is selected from: C₁-C₈ alkyl, C₃-C₁₁ cycloalkyl, aryl(C₁-C₆ alkyl)-, (C₁-C₆ alkyl)aryl, heteroaryl(C₁-C₆ alkyl)-, (C₁-C₆ alkyl)heteroaryl, biaryl(C₁-C₆ alkyl), heteroaryl, or aryl, wherein
 10 said aryl or heteroaryl groups are optionally substituted with 0-4 R¹⁹;

R^{18b} is selected from R^{18a} or H;

15 R¹⁹ is selected from H, halogen, CF₃, CO₂H, CN, NO₂, NR¹¹R¹², C₁-C₈ alkyl, C₂-C₆ alkenyl, C₂-C₆ alkynyl, C₃-C₁₁ cycloalkyl, C₄-C₁₁ cycloalkylalkyl, aryl(C₁-C₆ alkyl)-, C₁-C₆ alkoxy, OCF₃, or C₁-C₄ alkoxycarbonyl, aryl, -O-aryl, -SO₂-aryl,
 20 heteroaryl, or -SO₂-heteroaryl, wherein said aryl and heteroaryl groups may be substituted with 0-4 groups selected from hydrogen, halogen, CF₃, C₁-C₃ alkyl, or C₁-C₃ alkoxy;

25 R²⁰ is selected from hydroxy, C₁ to C₁₀ alkyloxy, C₃ to C₁₁ cycloalkyloxy, C₆ to C₁₀ aryloxy, C₇ to C₁₁ aralkyloxy, C₃ to C₁₀ alkylcarbonyloxyalkyloxy, C₃ to C₁₀ alkoxycarbonyloxyalkyloxy, C₂ to C₁₀ alkoxycarbonylalkyloxy, C₅ to C₁₀ cycloalkylcarbonyloxyalkyloxy, C₅ to C₁₀ cycloalkoxycarbonyloxyalkyloxy, C₅ to C₁₀ cycloalkoxycarbonylalkyloxy, C₇ to C₁₁ aryloxycarbonylalkyloxy, C₈ to C₁₂ aryloxycarbonyloxyalkyloxy, C₈ to C₁₂ arylcarbonyloxyalkyloxy, C₅ to C₁₀ alkoxyalkylcarbonyloxyalkyloxy, C₅ to C₁₀ (5-alkyl-

1,3-dioxa-cyclopenten-2-one-yl)methyloxy, C₁₀ to C₁₄
 (5-aryl-1,3-dioxa-cyclopenten-2-one-yl)methyloxy,
 or (R¹¹)(R¹²)N-(C₁-C₁₀ alkoxy)-;

5 R²¹ is selected from: C₁-C₈ alkyl, C₂-C₆ alkenyl, C₃-C₁₁
 cycloalkyl, C₄-C₁₁ cycloalkylmethyl, C₆-C₁₀ aryl,
 C₇-C₁₁ arylalkyl, or C₁-C₁₀ alkyl substituted with
 0-2 R⁷;

10 R²² is selected from:

-C(=O)-R^{18b},
 -C(=O)N(R^{18b})₂,
 -C(=O)NHSO₂R^{18a},
 -C(=O)NHC(=O)R^{18b},
 15 -C(=O)NHC(=O)OR^{18a} or,
 -C(=O)NHSO₂NHR^{18b},

m is 0-2;

n is 0-4;

20 p is 0-2;

q is 0-4;

r is 0-2;

s is 0-1;

25 with the following provisos:

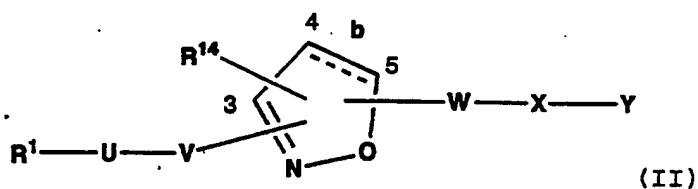
(1) when b is a double bond, only one of R¹⁴ or R¹⁵
 is present and Q and U are not -(CH₂)-; and

(2) n, m and q are chosen such that the number of
 atoms connecting R¹ and Y is in the range of
 30 8-14; and

(3) when V is -(phenyl)-Q-, then either: U is not a
 direct bond (i.e., U is not -(CH₂)_n- where n =
 0) or Q is not a direct bond (i.e., Q is not
 -(CH₂)_n- where n = 0).

35

3. A compound of Claim 2 of Formula II:



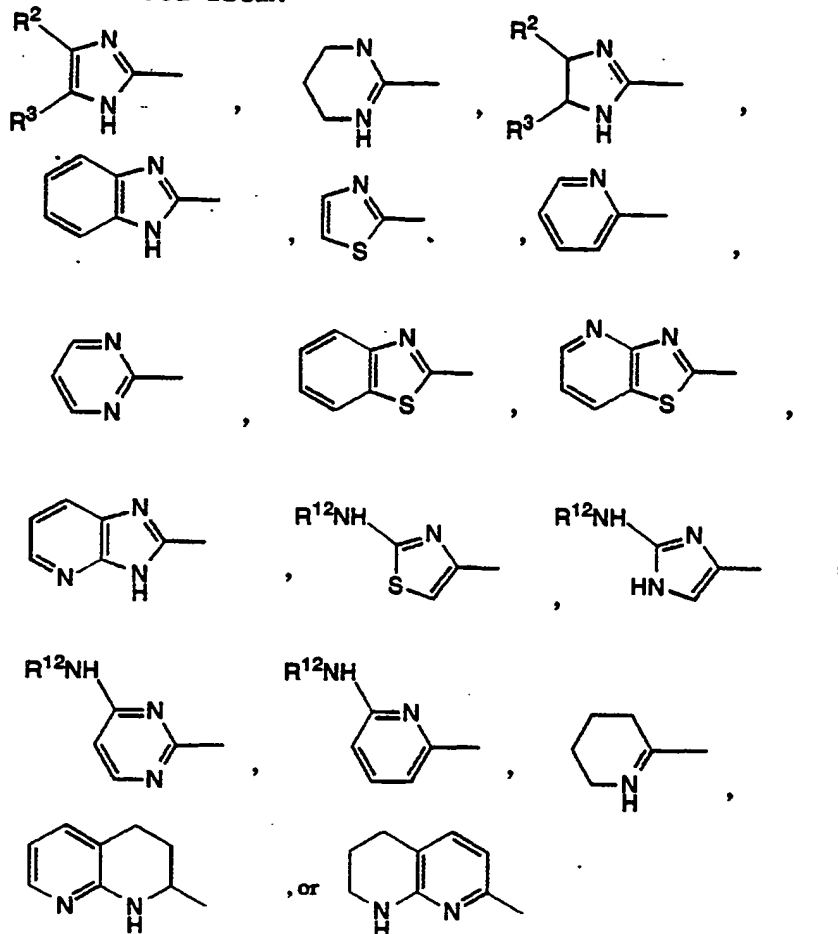
5

including enantiomeric or diastereomeric forms thereof,
or mixtures of enantiomeric or diastereomeric forms
thereof, or pharmaceutically acceptable salt or prodrug
forms thereof wherein:

10

b, the bond between carbon atoms numbered 4 and 5, is a
carbon-carbon single or double bond;

R¹ is selected from:



5

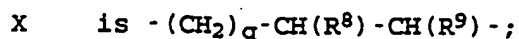
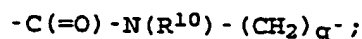
R² and R³ are independently selected from: H, C₁-C₄
 alkoxy, NR¹¹R¹², halogen, NO₂, CN, CF₃, C₁-C₆ alkyl,
 C₃-C₆ alkenyl, C₃-C₇ cycloalkyl, C₄-C₁₁
 cycloalkylalkyl, C₆-C₁₀ aryl substituted with 0-2
 10 R⁷, C₇-C₁₁ arylalkyl, C₂-C₇ alkylcarbonyl, or C₇-C₁₁
 arylcarbonyl;

15

alternatively, R² and R³ can be taken together with
 the carbon atoms to which they are attached to form
 a 5-7 membered carbocyclic or 5-7 membered

heterocyclic aromatic or nonaromatic ring system,
said carbocyclic or heterocyclic ring being
optionally substituted with 0-2 R⁷;

- 5 U is selected from:
 - (CH₂)_n -,
 - N(R¹²) (CH₂)_m -,
 - N(R¹⁰) C(=O) -, or
 - C(=O) N(R¹⁰) -;
 10 - N(R¹⁰) S(O)_p -, or
- V is selected from:
 - (CH₂)_n -,
 - (C₁-C₆ alkylene)-Q-, substituted with 0-3 groups
 15 independently selected from R¹³,
 - (C₂-C₇ alkenylene)-Q-, substituted with 0-3 groups
 independently selected from R¹³,
 - (C₂-C₇ alkynylene)-Q-, substituted with 0-3 groups
 independently selected from R¹³,
 20 - (phenyl)-Q-, said phenyl substituted with 0-2
 groups independently selected from R¹³,
 - (pyridyl)-Q-, said pyridyl substituted with 0-2
 groups independently selected from R¹³, or
 - (pyridazinyl)-Q-, said pyridazinyl substituted
 25 with 0-2 groups independently selected from
 R¹³;
- Q is selected from:
 - (CH₂)_n -,
 30 - (CH₂)_n O (CH₂)_m -,
 - (CH₂)_n N(R¹²) (CH₂)_m -,
 - N(R¹⁰) C(=O) -, or
 - C(=O) N(R¹⁰) -;
- 35 W is selected from:
 - (CH₂)_q C(=O) N(R¹⁰) -, or



R^6 is selected from:

- 10 H, C₁-C₄ alkyl, hydroxy, C₁-C₄ alkoxy, nitro, C₁-C₆ alkylcarbonyl, -N(R¹¹)R¹², cyano, halo, CF₃,
 -S(O)_pR¹⁰, CO₂R^{18a}, CONR¹⁷R^{18a}, -COR^{18a}, OR¹⁰,
 C₆ to C₁₀ aryl optionally substituted with 0-3
 groups selected from halogen, C₁-C₆ alkoxy,
 C₁-C₆ alkyl, CF₃, S(O)_mMe, or -NMe₂;
 a heterocyclic ring system selected from pyridinyl,
 15 furanyl, thiazolyl, thienyl, pyrrolyl,
 pyrazolyl, triazolyl, imidazolyl,
 benzofuranyl, indolyl, indolinyl, quinolinyl,
 isoquinolinyl, benzimidazolyl, piperidinyl,
 tetrahydrofuranyl, pyranyl, 3H-indolyl,
 20 carbazolyl, pyrrolidinyl, piperidinyl,
 isoxazolinyl, isoxazolyl, or morpholinyl;

R^7 is selected from:

- 25 H, C₁-C₄ alkyl, hydroxy, C₁-C₄ alkoxy, nitro, C₁-C₄ alkylcarbonyl, -N(R¹¹)R¹², CO₂R^{18a}, SO₂R¹¹,
 SO₂NR¹⁰R¹¹ or OR¹⁰;

R^8 is selected from:

- 30 H, CONR¹⁷R^{18a}, -CO₂R^{18a}, -COR^{18a}
 C₁-C₁₀ alkyl, substituted with 0-1 R⁶,
 C₂-C₁₀ alkenyl, substituted with 0-1 R⁶,
 C₂-C₁₀ alkynyl, substituted with 0-1 R⁶,
 C₃-C₈ cycloalkyl, substituted with 0-1 R⁶,
 aryl, substituted with 0-1 R⁶ or,

a heterocyclic ring system selected from pyridinyl,
furanyl, thiazolyl, thienyl, pyrrolyl,
pyrazolyl, triazolyl, imidazolyl,
benzofuranyl, indolyl, indolinyl, quinolinyl,
5 isoquinolinyl, benzimidazolyl, piperidinyl,
tetrahydrofuranyl, pyranal, 3H-indolyl,
carbazolyl, pyrrolidinyl, piperidinyl,
isoxazolyl, isoxazolyl or morpholinyl, said
heterocycle optionally substituted with 0-2
10 R⁷;

R⁹ is selected from: H or -N(R¹⁶)R¹⁷;

R¹⁰ is selected from H or C₁-C₁₀ alkyl, or C₇-C₁₀
15 arylalkyl;

R¹¹ is selected from hydrogen, hydroxy, C₁ to C₈ alkyl,
C₃-C₆ alkenyl, C₃ to C₁₁ cycloalkyl, C₄ to C₁₁
cycloalkylmethyl, C₁-C₆ alkoxy, benzyloxy, C₆ to C₁₀
20 aryl, heteroaryl, heteroarylalkyl, C₇ to C₁₁
arylalkyl, adamantylmethyl, or C₁-C₁₀ alkyl
substituted with 0-2 R⁴;

alternatively, R¹⁰ and R¹¹ when both are substituents on
25 the same nitrogen atom (as in -NR¹⁰R¹¹) can be taken
together with the nitrogen atom to which they are
attached to form a heterocycle selected from:
3-azabicyclononyl, 1,2,3,4-tetrahydro-1-quinolinyl,
1,2,3,4-tetrahydro-2-isoquinolinyl, 1-piperidinyl,
30 1-morpholinyl, 1-pyrrolidinyl, thiamorpholinyl,
thiazolidinyl or 1-piperazinyl; said heterocycle
being optionally substituted with 1-3 groups
selected from: C₁-C₆ alkyl, C₆-C₁₀ aryl, heteroaryl,
C₇-C₁₁ arylalkyl, C₁-C₆ alkylcarbonyl, C₃-C₇
35 cycloalkylcarbonyl, C₁-C₆ alkoxycarbonyl, C₇-C₁₁

arylalkoxycarbonyl, C₁-C₆ alkylsulfonyl or C₆-C₁₀ alkylsulfonyl;

R¹² is selected from:

- 5 H, C₁-C₆ alkyl, triphenylmethyl, methoxyphenyldiphenylmethyl, trimethylsilylethoxymethoxy (SEM), C₁-C₄ alkoxy, carbonyl, C₁-C₆ alkylcarbonyl, C₁-C₆ alkylsulfonyl, aryl(C₁-C₄ alkyl)sulfonyl, 10 arylsulfonyl, aryl, heteroarylcarbonyl, or heteroarylalkylcarbonyl, wherein said aryl groups are substituted with 0-3 substituents selected from the group consisting of: C₁-C₄ alkyl, C₁-C₄ alkoxy, halo, CF₃, and NO₂;

15 R¹³ is selected from: H, hydroxy, C₁-C₁₀ alkoxy, N(R¹⁰)R¹¹, -N(R¹⁶)R¹⁷, C₁-C₁₀ alkyl substituted with 0-3 R⁷, aryl substituted with 0-3 R⁷, heteroaryl substituted with 0-3 R⁷, or C₁-C₁₀ alkylcarbonyl;

20 R¹⁴ is selected from H, C₁-C₁₀ alkyl, C₂-C₁₀ alkenyl, C₂-C₁₀ alkynyl, C₁-C₁₀ alkoxy, aryl, heteroaryl or C₁-C₁₀ alkoxy, carbonyl, CO₂R¹⁰ or -C(=O)N(R¹⁰)R¹¹;

25 R¹⁶ is selected from:

-C(=O)-O-R^{18a},
-C(=O)-R^{18b},
-SO₂-R^{18a} or,
-SO₂-N(R^{18b})₂;

30 R¹⁷ is selected from H or C₁-C₄ alkyl;

R^{18a} is selected from: C₁-C₈ alkyl, C₃-C₁₁ cycloalkyl, aryl(C₁-C₆ alkyl)-, (C₁-C₆ alkyl)aryl, 35 heteroaryl(C₁-C₆ alkyl)-, (C₁-C₆ alkyl)heteroaryl, biaryl(C₁-C₆ alkyl), heteroaryl, or aryl, wherein

said aryl or heteroaryl groups are optionally substituted with 0-2 R¹⁹;

R^{18b} is selected from R^{18a} or H;

5

R¹⁹ is selected from H, halogen, CF₃, CO₂H, CN, NO₂, NR¹¹R¹², C₁-C₈ alkyl, C₂-C₆ alkenyl, C₂-C₆ alkynyl, C₃-C₁₁ cycloalkyl, C₄-C₁₁ cycloalkylalkyl, aryl(C₁-C₆ alkyl)-, C₁-C₆ alkoxy, OCF₃, or C₁-C₄ alkoxycarbonyl, aryl-, -O-aryl, -SO₂-aryl, heteroaryl, or -SO₂-heteroaryl, wherein said aryl and heteroaryl groups may be substituted with 0-4 groups selected from hydrogen, halogen, CF₃, C₁-C₃ alkyl, or C₁-C₃ alkoxy;

10

15

R²⁰ is selected from:

hydroxy;

C₁ to C₁₀ alkoxy;

methylcarbonyloxymethoxy-;

20

ethylcarbonyloxymethoxy-;

t-butylcarbonyloxymethoxy-;

cyclohexylcarbonyloxymethoxy-;

1-(methylcarbonyloxy)ethoxy-;

1-(ethylcarbonyloxy)ethoxy-;

25

1-(t-butylcarbonyloxy)ethoxy-;

1-(cyclohexylcarbonyloxy)ethoxy-;

i-propyloxycarbonyloxymethoxy-;

t-butyloxycarbonyloxymethoxy-;

1-(i-propyloxycarbonyloxy)ethoxy-;

30

1-(cyclohexyloxycarbonyloxy)ethoxy-;

1-(t-butyloxycarbonyloxy)ethoxy-;

dimethylaminoethoxy-;

diethylaminoethoxy-;

(5-methyl-1,3-dioxacyclopenten-2-on-4-yl)methoxy-;

(5-(*t*-butyl)-1,3-dioxacyclopenten-2-on-4-yl)methoxy-;
(1,3-dioxa-5-phenyl-cyclopenten-2-on-4-yl)methoxy-
or;
5 1-(2-(2-methoxypropyl)carbonyloxy)ethoxy-;

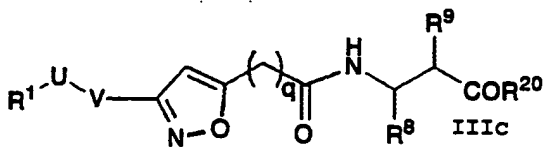
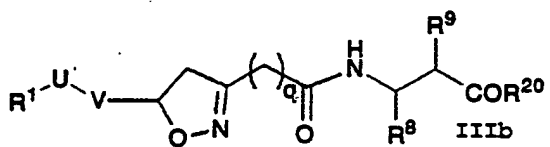
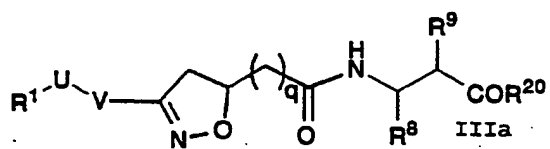
R²¹ is selected from C₁-C₈ alkyl, C₂-C₆ alkenyl, C₃-C₁₁ cycloalkyl, C₄-C₁₁ cycloalkylmethyl, C₆-C₁₀ aryl, C₇-C₁₁ arylalkyl, or C₁-C₁₀ alkyl substituted with
10 0-2 R⁴;

m is 0-2;
n is 0-4;
p is 0-2;
15 q is 0-1; and
r is 0-2;

with the following provisos:.

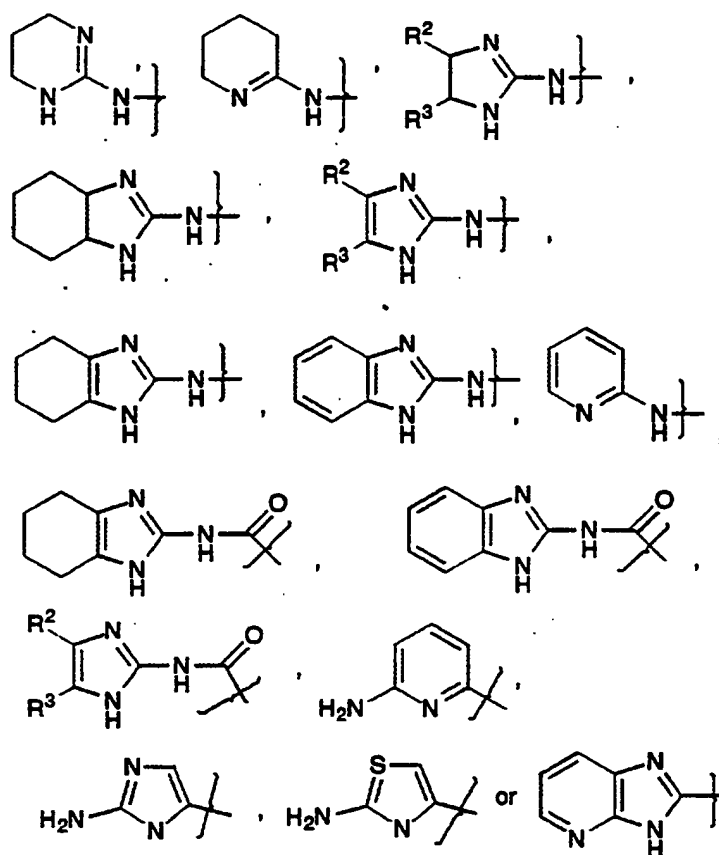
- 20 (1) when b is a double bond, Q and U are not -(CH₂)-; and
(2) n, m and q are chosen such that the number of atoms connecting R¹ and Y is in the range of 8-14; and
25 (3) when V is -(phenyl)-Q-, then either: U is not a direct bond (i.e., U is not -(CH₂)_n- where n = 0) or Q is not a direct bond (i.e., Q is not -(CH₂)_n- where n = 0).

30 4. A compound of Claim 2 of Formula IIIa, IIIb or IIIc:



including enantiomeric or diasteriomeric forms thereof,
 or mixtures of enantiomeric or diasteriomeric forms
 5 thereof, or pharmaceutically acceptable salt or prodrug
 forms thereof wherein:

R¹-U taken together are selected from:



5 R^2 and R^3 are independently selected from: H, C_1 - C_4 alkoxy, halogen, C_1 - C_6 alkyl, or C_3 - C_6 alkenyl;

V is selected from:
 - $(CH_2)_n$,
 - $(C_1$ - C_6 alkylene)-Q-, substituted with 0-1 groups
 10 independently selected from R^{13} or,
 - $(C_2$ - C_7 alkenylene)-Q-, substituted with 0-1 groups
 independently selected from R^{13} , or
 - (phenyl)-Q-, said phenyl substituted with 0-1
 groups independently selected from R^{13} ,

15

Q is selected from:

- (CH₂)_n -,
-O -,
-N(R¹²) -,
-N(R¹⁰)C(=O) -, or
5 -C(=O)N(R¹⁰) -;

R⁷ is selected from:

H, hydroxy, C₁-C₄ alkoxy, C₁-C₄ alkylcarbonyl,
-N(R¹⁰)(R¹¹), CO₂R^{18a}, SO₂N(R¹⁰)R¹¹, or OR¹⁰;

10

R⁸ is selected from:

H, CONR¹⁷R^{18a}, C₁-C₁₀ alkyl, C₂-C₁₀ alkenyl,
C₂-C₁₀ alkynyl, C₃-C₈ cycloalkyl, pyridinyl, or
aryl, wherein said aryl or pyridinyl groups
15 are optionally substituted with 0-3
substituents selected from the group
consisting of: C₁-C₄ alkyl, C₁-C₄ alkoxy,
aryl, halo, cyano, CF₃, and NO₂.

20 R⁹ is selected from: H or -NHR¹⁶;

R¹⁰ is selected from H or C₁-C₁₀ alkyl;

R¹¹ is selected from hydrogen, hydroxy, C₁ to C₈ alkyl,
25 C₃-C₆ alkenyl, C₃ to C₁₁ cycloalkyl, C₄ to C₁₁
cycloalkylmethyl, C₁-C₆ alkoxy, benzyloxy, C₆ to C₁₀
aryl, heteroaryl, heteroarylalkyl, C₇ to C₁₁
arylalkyl, or adamantylmethyl;

30 R¹³ is selected from: H, hydroxy, C₁-C₁₀ alkoxy,
N(R¹⁰)R¹¹, -N(R¹⁶)R¹⁷, C₁-C₁₀ alkyl substituted with
0-2 R⁷, aryl substituted with 0-3 R⁷, heteroaryl
substituted with 0-2 R⁷, or C₁-C₆ alkylcarbonyl;

35 R¹⁶ is selected from:

-C(=O)-O-R^{18a},

-SO₂-R^{18a} or,
-SO₂-NHR^{18a};

- 5 R^{18a} is selected from: C₁-C₈ alkyl, C₃-C₁₁ cycloalkyl,
aryl(C₁-C₆ alkyl)-, (C₁-C₆ alkyl)aryl,
heteroaryl(C₁-C₆ alkyl)-, (C₁-C₆ alkyl)heteroaryl,
biaryl(C₁-C₆ alkyl), heteroaryl, or aryl, wherein
said aryl or heteroaryl groups are optionally
substituted with 0-2 R¹⁹;
- 10 R¹⁹ is selected from: H, Br, F, Cl, CF₃, CN, NO₂, NHR¹¹,
C₁-C₄ alkyl, aryl, aryl(C₁-C₄ alkyl)-, C₁-C₄ alkoxy,
C₁-C₄ alkoxy carbonyl, or -O-aryl, wherein said aryl
groups are optionally substituted with 0-3
15 substituents selected from a group consisting of
halogen, CF₃, C₁-C₃ alkyl, or C₁-C₃ alkoxy;
- R²⁰ is selected from:
hydroxy;
20 C₁ to C₁₀ alkoxy;
methylcarbonyloxymethoxy-;
ethylcarbonyloxymethoxy-;
t-butylcarbonyloxymethoxy-;
cyclohexylcarbonyloxymethoxy-;
25 1-(methylcarbonyloxy)ethoxy-;
1-(ethylcarbonyloxy)ethoxy-;
1-(t-butylcarbonyloxy)ethoxy-;
1-(cyclohexylcarbonyloxy)ethoxy-;
i-propyloxycarbonyloxymethoxy-;
30 t-butylloxycarbonyloxymethoxy-;
1-(i-propyloxycarbonyloxy)ethoxy-;
1-(cyclohexyloxycarbonyloxy)ethoxy-;
1-(t-butylloxycarbonyloxy)ethoxy-;
dimethylaminoethoxy-;
35 diethylaminoethoxy-;

(5-methyl-1,3-dioxacyclopenten-2-on-4-yl)methoxy-;
(5-(t-butyl)-1,3-dioxacyclopenten-2-on-4-yl)methoxy-;
(1,3-dioxa-5-phenyl-cyclopenten-2-on-4-yl)methoxy-
5 or;
1-(2-(2-methoxypropyl)carbonyloxy)ethoxy-;

n is 0-4;

q is 0-1;

10

with the proviso that n, and q are chosen such that the number of atoms connecting R¹ and COR²⁰ is in the range of 8-14.

15

5. A compound of claim 1, and enantiomeric or diastereomeric forms thereof, or mixtures of enantiomeric or diastereomeric forms thereof, or pharmaceutically acceptable salt forms thereof selected from the group consisting of :

20

3-[3-[3-(imidazolin-2-ylamino)propyl]isoxazolin-5-ylmethylcarbonylamino]-2-(benzyloxy carbonylamino)-propionic acid,

25

3-[3-[3-(imidazolin-2-ylamino)propyl]isoxazolin-5-ylmethylcarbonylamino]-2-(n-butyloxy carbonyl-amino)propionic acid,

30

3-[3-[3-(imidazolin-2-ylamino)propyl]isoxazolin-5-ylmethylcarbonylamino]-2-(phenylsulfonylamino)propionic acid,

35

3-[3-[3-(imidazolin-2-ylamino)propyl]isoxazolin-5-ylmethylcarbonylamino]-2-(n-butylsulfonylamino)-propionic acid,

- 3- [3- [3- (tetrahydropyrimid-2-ylamino) propyl] -
isoxazolin-5-ylmethylcarbonylamino] -2-
(benzyloxycarbonylamino) propionic acid,
- 5 3- [3- [3- (tetrahydropyrimid-2-ylamino) propyl] -
isoxazolin-5-ylmethylcarbonyl amino] -2-
(n-butyloxycarbonylamino) propionic acid,
- 3- [3- [3- (tetrahydropyrimid-2-ylamino) propyl] -
isoxazolin-5-ylmethylcarbonylamino] -2-
(phenylsulfonylamino) propionic acid,
- 10 3- [3- [3- (tetrahydropyrimid-2-ylamino) propyl] -
isoxazolin-5-ylmethylcarbonylamino] -2- (n-
butylsulfonyl) aminopropionic acid,
- 3- [3- [4- (imidazolin-2-
ylamino) butyl] isoxazolin-5-
ylcarbonylamino] -2-
15 (benzyloxycarbonylamino) -propionic acid,
- 3- [3- [4- (imidazolin-2-
ylamino) butyl] isoxazolin-5-
ylcarbonylamino] -2- (n-butyloxycarbonyl-
20 amino) propionic acid,
- 3- [3- [4- (imidazolin-2-
ylamino) butyl] isoxazolin-5-
ylcarbonylamino] -2- (phenylsulfonylamino) -
propionic acid,
- 25 3- [3- [4- (imidazolin-2-
ylamino) butyl] isoxazolin-5-
ylcarbonylamino] -2- (n-butylsulfonylamino)
-propionic acid,
- 30 3- [3- [4- (tetrahydropyrimid-2-ylamino) butyl] -
isoxazolin-5-ylcarbonylamino] -2-
(benzyloxycarbonylamino) propionic acid,
- 3- [3- [4- (tetrahydropyrimid-2-ylamino) butyl] -
isoxazolin-5-ylcarbonyl amino] -2- (n-
butyloxycarbonylamino) propionic acid,

- 3- [3- [4- (tetrahydropyrimid-2-ylamino) butyl] -
isoxazolin-5-ylcarbonylamino] -2-
(phenylsulfonylamino) propionic acid,
- 5 3- [3- [4- (tetrahydropyrimid-2-ylamino) butyl] -
isoxazolin-5-ylcarbonylamino] -2- (n-
butylsulfonyl) aminopropionic acid,
- 3- [3- [3- (imidazolin-2-
ylamino) propyl] isoxazolin-5-
ylcarbonylamino] -2-
10 (benzyloxycarbonylamino) -propionic acid,
- 3- [3- [3- (imidazolin-2-
ylamino) propyl] isoxazolin-5-
ylcarbonylamino] -2- (phenylsulfonylamino)
propionic acid,
- 15 3- [3- [3- (tetrahydropyrimid-2-ylamino) propyl] -
isoxazolin-5-ylcarbonylamino] -2-
(benzyloxycarbonylamino) propionic acid,
- 3- [3- [3- (tetrahydropyrimid-2-ylamino) propyl] -
isoxazolin-5-ylcarbonylamino] -2-
20 (phenylsulfonylamino) propionic acid,
- 3- [3- [3- (2-aminothiazol-4-
yl) propyl] isoxazolin-5-ylcarbonylamino] -
2- (phenylsulfonylamino) propionic acid,
- 3- [3- [3- (2-aminothiazol-4-
yl) propyl] isoxazolin-5-ylcarbonylamino] -
2- (benzyloxycarbonylamino) propionic acid,
- 25 3- [3- [4- (imidazolin-2-
ylamino) butyl] isoxazolin-5-
ylcarbonylamino] -2- ((2,4,6-
30 trimethylphenyl) sulfonylamino) propionic
acid,
- 3- [3- [4- (tetrahydropyrimid-2-ylamino) butyl] -
isoxazolin-5-ylcarbonylamino] -2- ((2,4,6-
trimethylphenyl) sulfonylamino) propionic
35 acid,

- 3-[3-[4-(imidazol-2-ylamino)butyl]isoxazolin-5-ylcarbonylamino]-2-(benzyloxycarbonylamino)-propionic acid,
- 5 3-[3-[4-(imidazol-2-ylamino)butyl]isoxazolin-5-ylcarbonylamino]-2-(phenylsulfonylamino)-propionic acid,
- 3-[3-[4-(imidazol-2-ylamino)butyl]isoxazolin-5-ylcarbonylamino]-2-((2,6,dichlorophenyl)-sulfonylamino)propionic acid,
- 10 3-[3-[4-(imidazol-2-ylamino)butyl]isoxazolin-5-ylcarbonylamino]-2-((2,4,6,trimethylphenyl)sulfonylamino)propionic acid,
- 15 3-[3-[4-(imidazol-2-ylamino)butyl]isoxazolin-5-ylcarbonylamino]-2-((4-biphenyl)sulfonyl-amino)propionic acid,
- 3-[3-[4-(imidazol-2-ylamino)butyl]isoxazolin-5-ylcarbonylamino]-2-(1-naphthylsulfonylamino)propionic acid,
- 20 3-[3-[3-(imidazol-2-ylamino)propyl]isoxazolin-5-ylmethylcarbonylamino]-2-benzyloxycarbonylamino)propionic acid,
- 3-[3-[3-(imidazol-2-ylamino)propyl]isoxazolin-5-ylmethylcarbonylamino]-2-(phenylsulfonylamino)propionic acid,
- 25 3-[3-[3-(imidazol-2-ylamino)propyl]isoxazolin-5-ylmethylcarbonylamino]-2-((2,6,dichlorophenyl)sulfonylamino)propionic acid,
- 30 3-[3-[3-(imidazol-2-ylamino)propyl]isoxazolin-5-ylmethylcarbonylamino]-2-((2,4,6,trimethylphenyl)sulfonylamino)-propionic acid,

- 3- [3- [3- (imidazol-2-ylamino)propyl]isoxazolin-
5-ylmethylcarbonylamino] -2- ((4-biphenyl) -
sulfonylamino)propionic acid,
- 5 3- [3- [3- (imidazol-2-ylamino)propyl]isoxazolin-
5-ylmethylcarbonylamino] -2- (1-
naphthylsulfonylamino)propionic acid,
- 3- [3- [2- (imidazol-2-ylamino)ethyl]isoxazolin-
5-ylcarbonylamino] -2-
(benzyloxycarbonylamino) -propionic acid,
- 10 3- [3- [2- (imidazol-2-ylamino)ethyl]isoxazolin-
5-ylcarbonylamino] -2-
(phenylsulfonylamino) -propionic acid,
- 3- [3- [2- (imidazol-2-ylamino)ethyl]isoxazolin-
5-ylcarbonylamino] -2-
((2,6,dichlorophenyl) -
sulfonylamino)propionic acid,
- 15 3- [3- [2- (imidazol-2-ylamino)ethyl]isoxazolin-
5-ylcarbonylamino] -2-
((2,4,6,trimethylphenyl)sulfonylamino)
propionic acid,
- 20 3- [3- [2- (imidazol-2-ylamino)ethyl]isoxazolin-
5-ylcarbonylamino] -2- ((4-
biphenyl)sulfonyl- amino)propionic acid,
- 3- [3- [2- (imidazol-2-ylamino)ethyl]isoxazolin-
5-ylcarbonylamino] -2- (1-
naphthylsulfonylamino)propionic acid,
- 25 3- [3- [3- (imidazol-2-ylaminocarbonyl)propyl]
isoxazolin-5-ylcarbonylamino] -2-
((2,4,6,trimethylphenyl)sulfonylamino) -
propionic acid,
- 30 3- [3- [3- (2-aminoimidazol-4-
yl)propyl]isoxazolin-5-ylcarbonylamino] -
2- ((2,4,6,trimethylphenyl)sulfonylamino)
propionic acid,
- 35 3- [3- [2- (2-aminoimidazol-4-
yl)ethyl]isoxazolin-5-

- ylmethylcarbonylamino] -2-
((2,4,6,trimethylphenyl)sulfonylamino) -
propionic acid,
- 5 3- [3- [4- (benzimidazol-2-ylamino)butyl]
isoxazolin-5-ylcarbonylamino] -2-
((2,4,6,trimethylphenyl)sulfonylamino)
propionic acid,
- 10 3- [3- [3- (benzimidazol-2-ylamino)propyl]
isoxazolin-5-ylmethylcarbonylamino] -2-
((2,4,6,trimethylphenyl)sulfonylamino)
propionic acid,
- 15 3- [3- [3- (benzimidazol-2-ylaminocarbonyl)propyl] isoxazolin-5-ylcarbonylamino] -2-
((2,4,6,trimethylphenyl)sulfonylamino) -
propionic acid,
- 20 3- [3- [4- (4-methylimidazol-2-ylamino)butyl] -
isoxazolin-5-ylcarbonylamino] -2-
((2,4,6,trimethylphenyl)sulfonylamino) -
propionic acid,
- 25 3- [3- [3- (4-methylimidazol-2-ylamino)propyl] -
isoxazolin-5-ylmethylcarbonylamino] -2-
((2,4,6,trimethylphenyl)sulfonylamino) -
propionic acid,
- 30 3- [3- [4- (4,5-dimethylimidazol-2-ylamino)butyl] - isoxazolin-5-ylcarbonylamino] -2-
((2,4,6,trimethylphenyl)sulfonylamino) -
propionic acid,
- 35 3- [3- [3- (4,5-dimethylimidazol-2-ylaminocarbonyl)propyl] isoxazolin-5-

- ylcarbonylamino]-2-
((2,4,6,trimethylphenyl)sulfonylamino)-
propionic acid,
- 5 3-[3-[4-(4,5,6,7-tetrahydrobenzimidazol-2-ylamino)butyl]isoxazolin-5-ylcarbonylamino]-2-
((2,4,6,trimethylphenyl)sulfonylamino)-
propionic acid,
- 10 3-[3-[3-(4,5,6,7-tetrahydrobenzimidazol-2-ylamino)propyl]isoxazolin-5-ylmethylcarbonylamino]-2-
((2,4,6,trimethylphenyl)sulfonylamino)propionic acid,
- 15 3-[3-[4-(pyridin-2-ylamino)butyl]isoxazolin-5-ylcarbonylamino]-2-
((2,4,6,trimethylphenyl)sulfonylamino)propionic acid,
- 20 3-[3-[3-(pyridin-2-ylamino)propyl]isoxazolin-5-ylmethylcarbonylamino]-2-
((2,4,6,trimethylphenyl)sulfonylamino)propionic acid,
- 25 3-[3-[3-(2-pyridin-6-yl)propyl]isoxazolin-5-ylcarbonylamino]-2-
((2,4,6,trimethylphenyl)sulfonylamino)propionic acid,
- 30 3-[3-[3-(7-azabenzimidazol-2-yl)propyl]isoxazolin-5-ylcarbonylamino]-2-
((2,4,6,trimethylphenyl)sulfonylamino)propionic acid,
- 35 3-[5-[3-(imidazolin-2-ylamino)propyl]isoxazolin-3-ylmethylcarbonylamino]-2-
(benzyloxycarbonylamino)-propionic acid,

- 3-[5-[3-(imidazolin-2-ylamino)propyl]isoxazolin-3-ylmethylcarbonylamino]-2-(n-butylloxycarbonyl-amino)propionic acid,
- 5 3-[5-[3-(imidazolin-2-ylamino)propyl]isoxazolin-3-ylmethylcarbonylamino]-2-(phenylsulfonylamino)propionic acid,
- 10 3-[5-[3-(imidazolin-2-ylamino)propyl]isoxazolin-3-ylmethylcarbonylamino]-2-(2,4,6-trimethylphenylsulfonylamino)propionic acid,
- 15 3-[5-[3-(imidazolin-2-ylamino)propyl]isoxazolin-3-ylmethylcarbonylamino]-2-(n-butylsulfonylamino)-propionic acid,
- 20 3-[5-[3-(tetrahydropyrimid-2-ylamino)propyl]isoxazolin-3-ylmethylcarbonylamino]-2-(benzyloxycarbonylamino)propionic acid,
- 25 3-[5-[3-(tetrahydropyrimid-2-ylamino)propyl]isoxazolin-3-ylmethylcarbonyl amino]-2-(n-butylloxycarbonylamino)propionic acid,
- 30 3-[5-[3-(tetrahydropyrimid-2-ylamino)propyl]isoxazolin-3-ylmethylcarbonylamino]-2-(phenylsulfonylamino)propionic acid,
- 35 3-[5-[3-(tetrahydropyrimid-2-ylamino)propyl]isoxazolin-3-ylmethylcarbonylamino]-2-(2,4,6-trimethylphenylsulfonylamino)propionic acid,
- 3-[5-[3-(tetrahydropyrimid-2-ylamino)propyl]isoxazolin-3-ylmethylcarbonylamino]-2-(n-butylsulfonyl)aminopropionic acid,
- 3-[5-[4-(imidazolin-2-ylamino)butyl]isoxazolin-3-

- ylcarbonylamino]-2-
(benzyloxycarbonylamino)- propionic acid,
3-[5-[4-(imidazolin-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino]-2-(n-butyloxycarbonylamino)propionic acid,
3-[5-[4-(imidazolin-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino]-2-(phenylsulfonylamino)propionic acid,
3-[5-[4-(imidazolin-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino]-2-(n-butylsulfonylamino)propionic acid,
3-[5-[4-(tetrahydropyrimid-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino]-2-(benzyloxycarbonylamino)propionic acid,
3-[5-[4-(tetrahydropyrimid-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino]-2-(n-butyloxycarbonylamino)propionic acid,
3-[5-[4-(tetrahydropyrimid-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino]-2-(phenylsulfonylamino)propionic acid,
3-[5-[4-(tetrahydropyrimid-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino]-2-(n-butylsulfonyl)aminopropionic acid,
3-[5-[3-(imidazol-2-ylamino)propyl]isoxazolin-3-ylcarbonylamino]-2-(benzyloxycarbonylamino)-propionic acid,
3-[5-[3-(imidazolin-2-ylamino)propyl]isoxazolin-3-ylcarbonylamino]-2-(n-propyloxycarbonylamino)propionic acid,
3-[5-[3-(imidazolin-2-ylamino)propyl]isoxazolin-3-

- ylcarbonylamino]-2-(phenylsulfonylamino)propionic acid,
3-[5-[3-(imidazolin-2-ylamino)propyl]isoxazolin-3-ylcarbonylamino]-2-(n-propylsulfonylamino)propionic acid,
3-[5-[3-(tetrahydropyrimid-2-ylamino)propyl]isoxazolin-3-ylcarbonylamino]-2-(benzyloxycarbonylamino)propionic acid,
3-[5-[3-(tetrahydropyrimid-2-ylamino)propyl]isoxazolin-3-ylmethylcarbonylamino]-2-(n-propyloxycarbonylamino)propionic acid,
3-[5-[3-(tetrahydropyrimid-2-ylamino)propyl]isoxazolin-3-ylcarbonylamino]-2-(phenylsulfonylamino)propionic acid,
3-[5-[3-(tetrahydropyrimid-2-ylamino)propyl]isoxazolin-3-ylcarbonylamino]-2-(n-propylsulfonyl)aminopropionic acid,
3-[5-[2-(imidazolin-2-ylamino)ethyl]isoxazolin-3-ylcarbonylamino]-2-(phenylsulfonylamino)propionic acid,
3-[5-[4-(pyridin-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino]-2-(phenylsulfonylamino)propionic acid,
3-[5-[4-(pyridin-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino]-2-(2,6-dichlorophenylsulfonylamino)propionic acid,
3-[5-[4-(pyridin-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino]-2-(2,4,6-trimethylphenylsulfonylamino)propionic acid,
3-[5-[4-(pyridin-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino]-2-(4-biphenylsulfonylamino)propionic acid,

- 3-[5-[4-(pyridin-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino]-2-(1-naphthylsulfonylamino)propionic acid,
- 5 3-[5-[3-(2-aminopyridin-6-yl)propyl]isoxazolin-3-ylcarbonylamino]-2-(2,4,6-trimethylphenylsulfonylamino)propionic acid,
- 10 3-[5-[4-(imidazol-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino]-2-(phenylsulfonylamino)-propionic acid,
- 3-[5-[4-(imidazol-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino]-2-(2,6-dichlorophenylsulfonylamino)propionic acid,
- 15 3-[5-[4-(imidazol-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino]-2-(2,4,6-trimethylphenylsulfonylamino)propionic acid,
- 3-[5-[4-(imidazol-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino]-2-(4-biphenylsulfonylamino)propionic acid,
- 20 3-[5-[4-(imidazol-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino]-2-(1-naphthylsulfonylamino)propionic acid,
- 3-[5-[3-(2-aminoimidazol-4-yl)propyl]isoxazolin-3-ylcarbonylamino]-2-(phenylsulfonylamino)-propionic acid,
- 25 3-[5-[3-(2-aminoimidazol-4-yl)propyl]isoxazolin-3-ylcarbonylamino]-2-(2,6-dichlorophenylsulfonylamino)propionic acid,
- 30 3-[5-[3-(2-aminoimidazol-4-yl)propyl]isoxazolin-3-ylcarbonylamino]-2-(2,4,6-trimethylphenylsulfonylamino)propionic acid,
- 35 3-[5-[3-(2-aminoimidazol-4-yl)propyl]isoxazolin-3-ylcarbonylamino]-

- 2-(4-biphenylsulfonylamino)propionic acid,
- 5 3-[5-[3-(2-aminoimidazol-4-yl)propyl]isoxazolin-3-ylcarbonylamino]-2-(1-naphthylsulfonylamino)propionic acid,
- 3-[5-[2-(imidazol-2-ylamino)ethyl]isoxazolin-3-ylcarbonylamino]-2-(phenylsulfonylamino)-propionic acid,
- 10 3-[5-[2-(imidazol-2-ylamino)ethyl]isoxazolin-3-ylcarbonylamino]-2-(2,6-dichlorophenylsulfonylamino)propionic acid,
- 3-[5-[2-(imidazol-2-ylamino)ethyl]isoxazolin-3-ylcarbonylamino]-2-(2,4,6-trimethylphenylsulfonylamino)propionic acid,
- 15 3-[5-[2-(imidazol-2-ylamino)ethyl]isoxazolin-3-ylcarbonylamino]-2-(4-biphenylsulfonylamino)propionic acid,
- 20 3-[5-[2-(imidazol-2-ylamino)ethyl]isoxazolin-3-ylcarbonylamino]-2-(1-naphthylsulfonylamino)propionic acid,
- 3-[5-[3-(imidazol-2-ylaminocarbonyl)propyl]isoxazolin-3-ylcarbonylamino]-2-(2,4,6-trimethylphenylsulfonylamino)propionic acid,
- 25 3-[5-[3-(benzimidazol-2-ylaminocarbonyl)propyl]isoxazolin-3-ylcarbonylamino]-2-(2,4,6-trimethylphenylsulfonylamino)propionic acid,
- 30 3-[5-[4-(benzimidazol-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino]-2-(phenylsulfonylamino)propionic acid,
- 35 3-[5-[4-(benzimidazol-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino]-2-(2,6-

- dichlorophenylsulfonylamino)propionic acid,
- 3- [5- [4- (benzimidazol-2-ylamino)butyl] isoxazolin-3-ylcarbonylamino] -2- (2,4,6-trimethylphenylsulfonylamino)propionic acid,
- 3- [5- [4- (benzimidazol-2-ylamino)butyl] isoxazolin-3-ylcarbonylamino] -2- (4-biphenylsulfonylamino)propionic acid,
- 3- [5- [4- (benzimidazol-2-ylamino)butyl] isoxazolin-3-ylcarbonylamino] -2- (1-naphthylsulfonylamino)propionic acid,
- 3- [5- [4- (4-methylimidazol-2-ylamino)butyl] - isoxazolin-3-ylcarbonylamino] -2- (phenylsulfonylamino) propionic acid,
- 3- [5- [4- (4-methylimidazol-2-ylamino)butyl] - isoxazolin-3-ylcarbonylamino] -2- (2,6-dichlorophenylsulfonylamino)propionic acid,
- 3- [5- [4- (4-methylimidazol-2-ylamino)butyl] - isoxazolin-3-ylcarbonylamino] -2- (2,4,6-trimethylphenylsulfonylamino)propionic acid,
- 3- [5- [4- (4-methylimidazol-2-ylamino)butyl] - isoxazolin-3-ylcarbonylamino] -2- (4-biphenylsulfonylamino)propionic acid,
- 3- [5- [4- (4-methylimidazol-2-ylamino)butyl] - isoxazolin-3-ylcarbonylamino] -2- (1-naphthylsulfonylamino)propionic acid,
- 3- [5- [4- (4,5-dimethylimidazol-2-ylamino)butyl] - isoxazolin-3-ylcarbonylamino] -2- (phenylsulfonylamino) propionic acid,
- 3- [5- [4- (4,5-dimethylimidazol-2-ylamino)butyl] - isoxazolin-3-ylcarbonylamino] -2- (2,6-

- dichlorophenylsulfonylamino)propionic acid,
- 3-[5-[4-(4,5-dimethylimidazol-2-ylamino)butyl]-isoxazolin-3-ylcarbonylamino]-2-(2,4,6-trimethylphenylsulfonylamino)propionic acid,
- 3-[5-[4-(4,5-dimethylimidazol-2-ylamino)butyl]-isoxazolin-3-ylcarbonylamino]-2-(4-biphenylsulfonylamino)propionic acid,
- 3-[5-[4-(4,5-dimethylimidazol-2-ylamino)butyl]-isoxazolin-3-ylcarbonylamino]-2-(1-naphthylsulfonylamino)propionic acid,
- 3-[5-[4-(4,5,6,7-tetrahydrobenzimidazol-2-ylamino)butyl]-isoxazolin-3-ylcarbonylamino]-2-(phenylsulfonylamino)propionic acid,
- 3-[5-[4-(4,5,6,7-tetrahydrobenzimidazol-2-ylamino)butyl]-isoxazolin-3-ylcarbonylamino]-2-(2,6-dichlorophenylsulfonylamino)propionic acid,
- 3-[5-[4-(4,5,6,7-tetrahydrobenzimidazol-2-ylamino)butyl]-isoxazolin-3-ylcarbonylamino]-2-(2,4,6-trimethylphenylsulfonylamino)propionic acid,
- 3-[5-[4-(4,5,6,7-tetrahydrobenzimidazol-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino]-2-(4-biphenylsulfonylamino)propionic acid,
- 3-[5-[4-(4,5,6,7-tetrahydrobenzimidazol-2-ylamino)butyl]-isoxazolin-3-ylcarbonylamino]-2-(1-naphthylsulfonylamino)propionic acid,

- 3-[5-[3-(7-azabenzimidazol-2-yl)propyl]
isoxazolin-3-ylcarbonylamino]-2-(2,4,6-
trimethylphenylsulfonylamino) propionic
acid,
- 5 3-[5-[4-(imidazol-2-ylamino)butyl]isoxazolin-
3-ylcarbonylamino]-2-[(2,6-dimethyl-4-
phenyl)phenylsulfonylamino]propionic
acid,
- 10 3-[5-[4-(4-methylimidazol-2-
ylamino)butyl]isoxazolin-3-
ylcarbonylamino]-2-[(2,6-dimethyl-4-
phenyl)phenylsulfonylamino]propionic
acid,
- 15 3-[5-[4-(4,5-dimethylimidazol-2-
ylamino)butyl]isoxazolin-3-
ylcarbonylamino]-2-[(2,6-dimethyl-4-
phenyl)phenylsulfonylamino]propionic
acid,
- 20 3-[5-[4-(4,5,6,7-tetrahydrobenzimidazol-2-
ylamino)butyl]isoxazolin-3-
ylcarbonylamino]-2-[(2,6-dimethyl-4-
phenyl)phenylsulfonylamino]propionic
acid,
- 25 3-[5-[4-(imidazol-2-ylamino)butyl]isoxazolin-
3-ylcarbonylamino]-2-[(2,6-dichloro-4-
phenyl)phenylsulfonylamino]propionic
acid,
- 30 3-[5-[4-(4-methylimidazol-2-
ylamino)butyl]isoxazolin-3-
ylcarbonylamino]-2-[(2,6-dichloro-4-
phenyl)phenylsulfonylamino]propionic
acid,
- 35 3-[5-[4-(4,5-dimethylimidazol-2-
ylamino)butyl]isoxazolin-3-
ylcarbonylamino]-2-[(2,6-dichloro-4-

- phenyl)phenylsulfonylamino]propionic acid,
- 3- [5- [4- (4,5,6,7-tetrahydrobenzimidazol-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino] -2- [(2,6-dichloro-4-phenyl)phenylsulfonylamino]propionic acid,
- 3- [5- [4- (imidazol-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino] -3- (phenylsulfonylmethyl) propionic acid,
- 3- [5- [4- (imidazol-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino] -3- (1-adamantylmethylaminocarbonyl)propionic acid,
- 3- [5- [4- (imidazol-2-ylamino)butyl]isoxazolin-3-ylcarbonylamino] -3- (3-pyridinyl)propionic acid,
- 3- [3- [3- (imidazolin-2-yl amino)propyloxy]isoxazol-5-ylcarbonylamino] -2- (benzyloxycarbonylamino)-propionic acid,
- 3- [3- [3- (imidazolin-2-ylamino)propyloxy]isoxazol-5-yl carbonyl amino] -2- (n-butyloxycarbonyl-amino)propionic acid,
- 3- [3- [3- (imidazolin-2-ylamino)propyloxy]isoxazol-5-yl carbonylamino] -2- (phenylsulfonylamino)propionic acid,
- 3- [3- [3- (imidazolin-2-ylamino)propyloxy]isoxazol-5-yl carbonyl amino] -2- (n-butylysulfonylamino)-propionic acid,
- 3- [3- [3- (tetrahydropyrimid-2-ylamino)propyloxy] -isoxazol-5-ylcarbonylamino] -2- (benzyloxycarbonylamino)propionic acid,
- 3- [3- [3- (tetrahydropyrimid-2-ylamino)propyloxy] -isoxazol-5-ylcarbonyl amino] -2- (n-butyloxycarbonylamino)propionic acid,

- 3-[3-[3-(tetrahydropyrimid-2-ylamino)propyloxy]-isoxazol-5-ylcarbonylamino]-2-(phenylsulfonylamino)propionic acid,
- 5 3-[3-[3-(tetrahydropyrimid-2-ylamino)propyloxy]-isoxazol-5-ylcarbonylamino]-2-(n-butylsulfonyl)aminopropionic acid,
- 10 3-[3-[2-(imidazolin-2-yl amino)ethyloxy]isoxazol-5-yl carbonylamino]-2-(benzyloxycarbonylamino)-propionic acid,
- 15 3-[3-[3-(imidazolin-2-ylamino)ethyloxy]isoxazol-5-ylcarbonylamino]-2-(n-butyloxycarbonylamino)propionic acid,
- 20 3-[3-[3-(imidazolin-2-ylamino)ethyloxy]isoxazol-5-ylcarbonylamino]-2-(n-butylsulfonylamino)propionic acid,
- 25 3-[3-[3-(tetrahydropyrimid-2-yl amino)ethyloxy]-isoxazol-5-ylcarbonylamino]-2-(benzyloxycarbonylamino)propionic acid,
- 30 3-[3-[3-(tetrahydropyrimid-2-ylamino)ethyloxy]-isoxazol-5-ylcarbonylamino]-2-(n-butyloxycarbonylamino)propionic acid,
- 35 3-[3-[3-(tetrahydropyrimid-2-ylamino)ethyloxy]-isoxazol-5-ylcarbonylamino]-2-(phenylsulfonylamino)propionic acid,

- 3- [3- [3- (tetrahydropyrimid-2-ylamino) ethyloxy] -isoxazol-5-ylcarbonylamino] -2- (n-butylsulfonylamino) propionic acid,
- 5 3- [3- [3- (imidazol-2-ylamino) propyloxy] -isoxazol-5-ylcarbonylamino] -2- (phenylsulfonylamino) propionic acid,
- 3- [3- [3- (benzimidazol-2-ylamino) propyloxy] -isoxazol-5-ylcarbonylamino] -2- (phenylsulfonylamino) propionic acid,
- 10 3- [3- [3- (4-methylimidazol-2-ylamino) propyloxy] -isoxazol-5-ylcarbonylamino] -2- (phenylsulfonylamino) propionic acid,
- 15 3- [3- [3- (4,5-dimethylimidazol-2-ylamino) propyloxy] -isoxazol-5-ylcarbonylamino] -2- (phenylsulfonylamino) propionic acid,
- 20 3- [3- [3- (4,5,6,7-tetrahydrobenzimidazol-2-ylamino) propyloxy] -isoxazol-5-ylcarbonylamino] -2- (phenylsulfonylamino) propionic acid,
- 3- [3- [3- (pyridin-2-ylamino) propyloxy] -isoxazol-5-ylcarbonylamino] -2- (phenylsulfonylamino) propionic acid, and
- 25 3- [3- [3- (imidazol-2-ylaminocarbonyl) ethoxy] -isoxazol-5-ylcarbonylamino] -2- (phenylsulfonylamino) propionic acid.

- 30 6. A method of treating angiogenic disorders, inflammation, bone degradation, or thrombosis, comprising administering to a host in need of such treatment a therapeutically effective amount of a compound of Claim 1.

35

7. A method of treating angiogenic disorders,
inflammation, bone degradation, or thrombosis,
comprising administering to a host in need of such
treatment a therapeutically effective amount of a
5 compound of Claim 2.

8. A method of treating angiogenic disorders,
inflammation, bone degradation, or thrombosis,
comprising administering to a host in need of such
10 treatment a therapeutically effective amount of a
compound of Claim 3.

9. A method of treating angiogenic disorders,
inflammation, bone degradation, or thrombosis,
15 comprising administering to a host in need of such
treatment a therapeutically effective amount of a
compound of Claim 4.

10. A method of treating angiogenic disorders,
20 inflammation, bone degradation, or thrombosis,
comprising administering to a host in need of such
treatment a therapeutically effective amount of a
compound of Claim 5.

25 11. A pharmaceutical composition comprising a
therapeutically effective amount of a compound of Claim
1 and a pharmaceutically acceptable carrier.

12. A pharmaceutical composition comprising a
30 therapeutically effective amount of a compound of Claim
2 and a pharmaceutically acceptable carrier.

13. A pharmaceutical composition comprising a
therapeutically effective amount of a compound of Claim
35 3 and a pharmaceutically acceptable carrier.

14. A pharmaceutical composition comprising a therapeutically effective amount of a compound of Claim 4 and a pharmaceutically acceptable carrier.

5 15. A pharmaceutical composition comprising a therapeutically effective amount of a compound of Claim 5 and a pharmaceutically acceptable carrier.

10 16. A method for the treatment of thrombosis which comprises administering to a host in need of such treatment a therapeutically effective amount of a compound of Claim 1 in combination with one or more additional therapeutic agents selected from: a thrombolytic agent, an anti-coagulant agent, or an
15 anti-platelet agent.

17. A method of inhibiting angiogenesis, comprising administering to a host in need of such inhibition a therapeutically effective amount of a
20 compound of Claim 1.

18. A method of inhibiting angiogenesis, comprising administering to a host in need of such inhibition a therapeutically effective amount of a
25 compound of Claim 2.

19. A method of inhibiting angiogenesis, comprising administering to a host in need of such inhibition a therapeutically effective amount of a
30 compound of Claim 3.

20. A method of inhibiting angiogenesis, comprising administering to a host in need of such inhibition a therapeutically effective amount of a
35 compound of Claim 4.

21. A method of inhibiting angiogenesis,
comprising administering to a host in need of such
inhibition a therapeutically effective amount of a
compound of Claim 5.

5

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 96/07646

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 C07D413/12 A61K31/505 A61K31/42 C07D413/06 C07D417/06
 C07D471/04 C07D413/14 A61K31/44 //(C07D471/04,235:00,
 221:00)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 C07D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO,A,94 08577 (MERCK & CO INC) 28 April 1994 cited in the application see claims ---	1-21
A	EP,A,0 525 629 (DR KARLTHOMAE GMBH) 3 February 1993 cited in the application see claims ---	1-21
A	EP,A,0 237 082 (SYNTEX INC) 16 September 1987 see claims ---	1-21
P,X	WO,A,95 14683 (THE DU PONT MERCK PHARMACEUTICAL COMPANY) 1 June 1995 cited in the application see claims -----	1-21

☐ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

& document member of the same patent family

Date of the actual completion of the international search

22 August 1996

Date of mailing of the international search report

30.08.96

Name and mailing address of the ISA

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Authorized officer

Henry, J

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 96/07646

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
Although claims 6-10 and 16-21 are directed to a method of treatment of the human body the search has been carried out and based on the alleged effects of the compounds.
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
The definition of the substituents is too general and is only partly supported by the examples. Guided by the spirit of the application, the search was carried out on the basis of the examples.
Claims searched incompletely: 1-4, 6-9, 11-14, 16-20
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 96/07646

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO-A-9408577	28-04-94	AU-B- 5357894 CA-A- 2144762 EP-A- 0667773 JP-T- 8502486	09-05-94 28-04-94 23-08-95 19-03-96
EP-A-0525629	03-02-93	DE-A- 4124942 AU-B- 652064 AU-B- 2056992 CA-A- 2074685 JP-A- 5221999 NZ-A- 243713 US-A- 5463071 ZA-A- 9205573	28-01-93 11-08-94 28-01-93 28-01-93 31-08-93 27-06-95 31-10-95 24-01-94
EP-A-0237082	16-09-87	AU-B- 599636 AU-B- 6998787 JP-A- 62252779 US-A- 4912120 US-A- 4929630	26-07-90 17-09-87 04-11-87 27-03-90 29-05-90
WO-A-9514683	01-06-95	AU-B- 1098095 CA-A- 2174838 NO-A- 962096	13-06-95 01-06-95 23-05-96